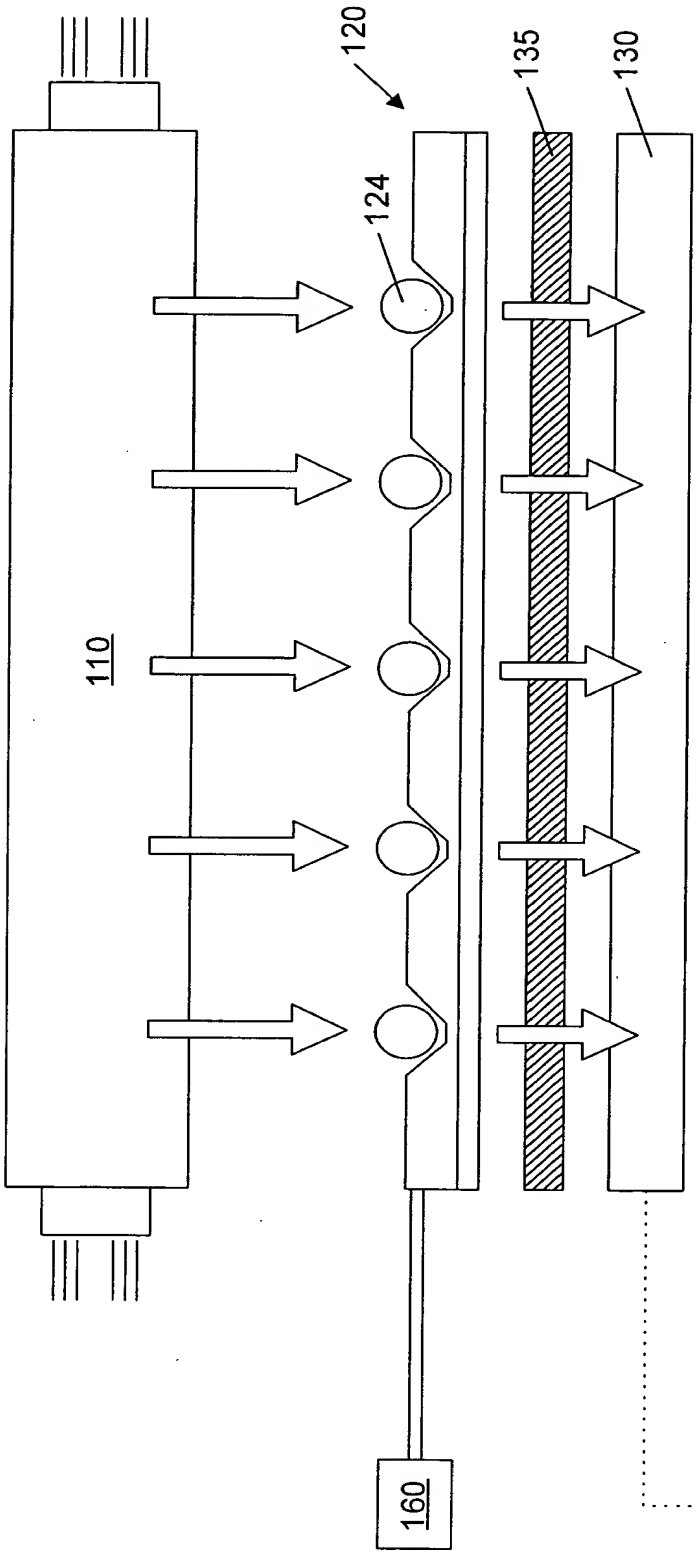


FIG. 1

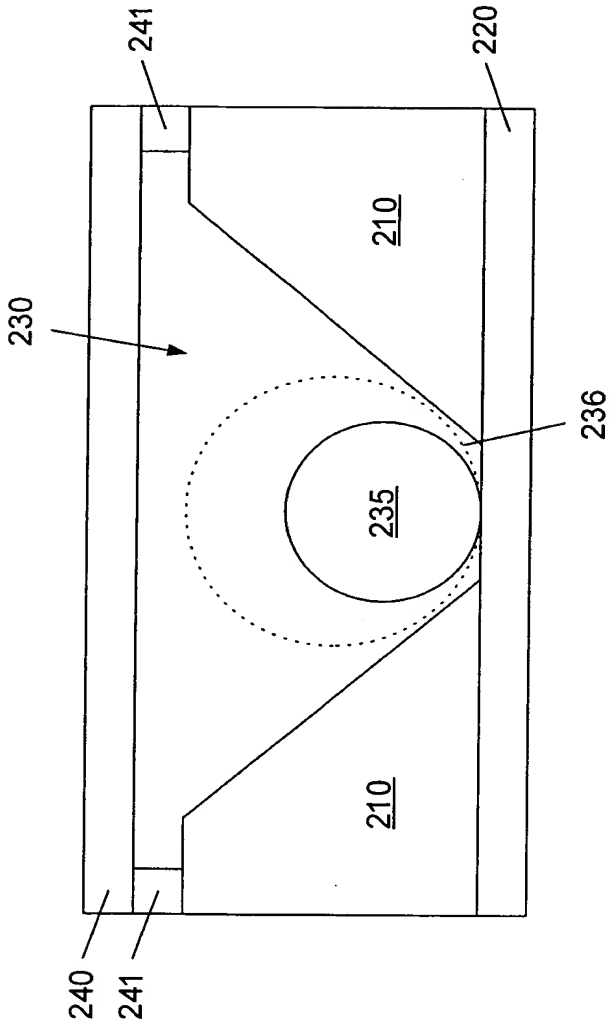


FIG. 2

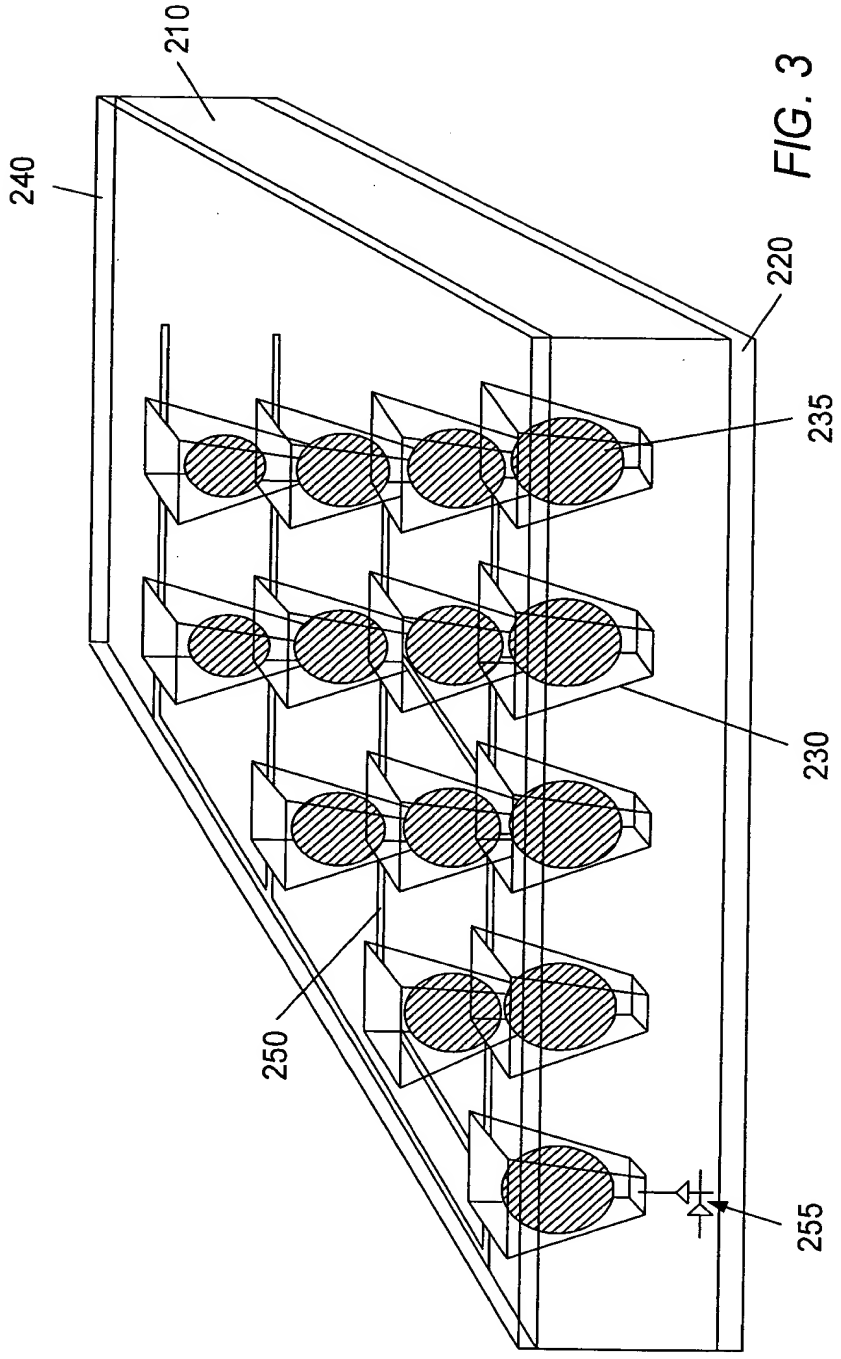


FIG. 3

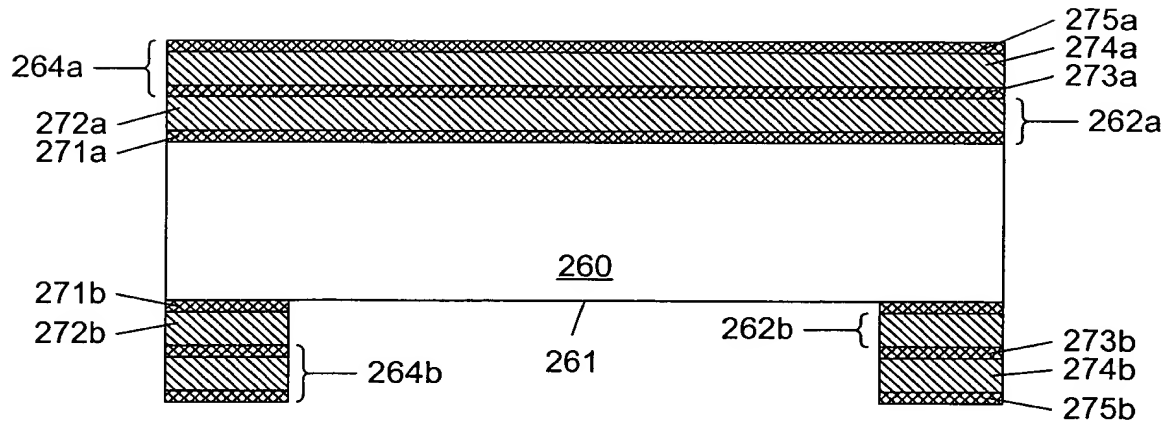


FIG. 4A

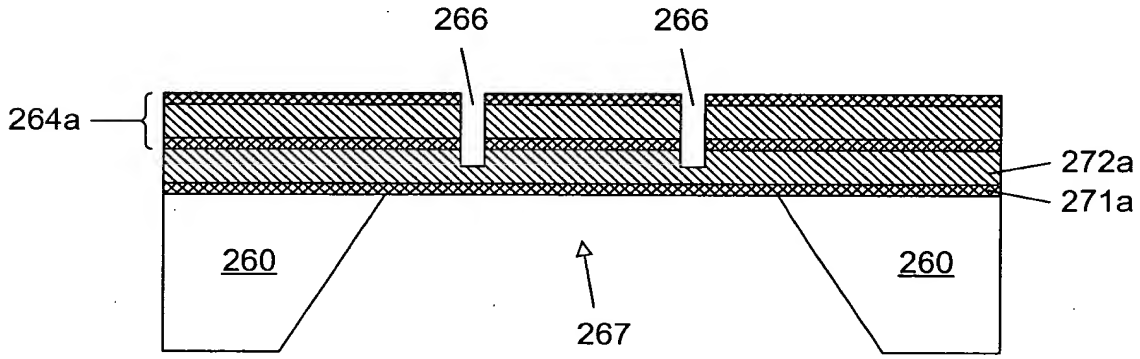


FIG. 4B

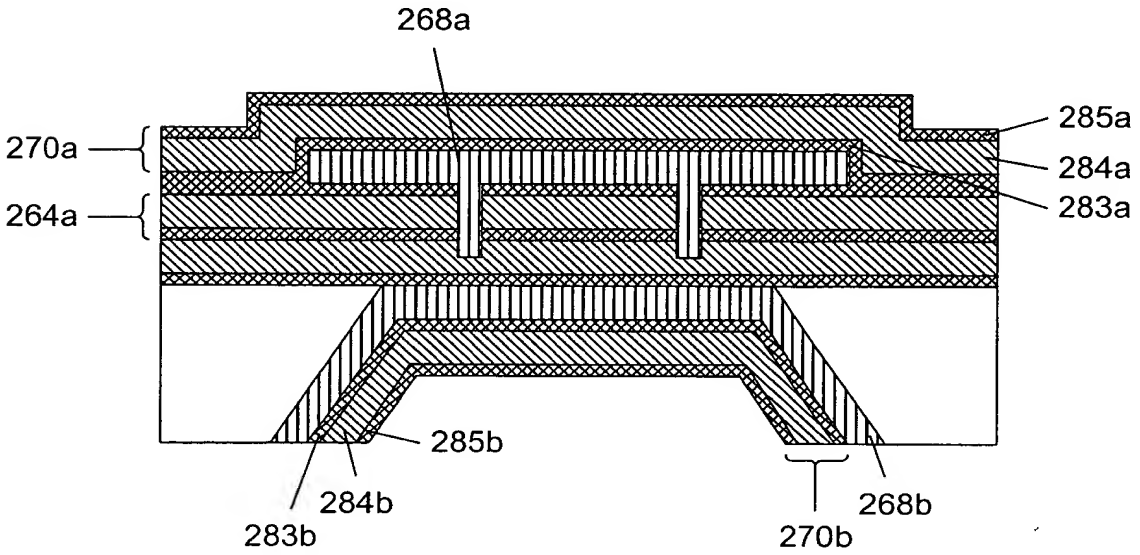


FIG. 4C

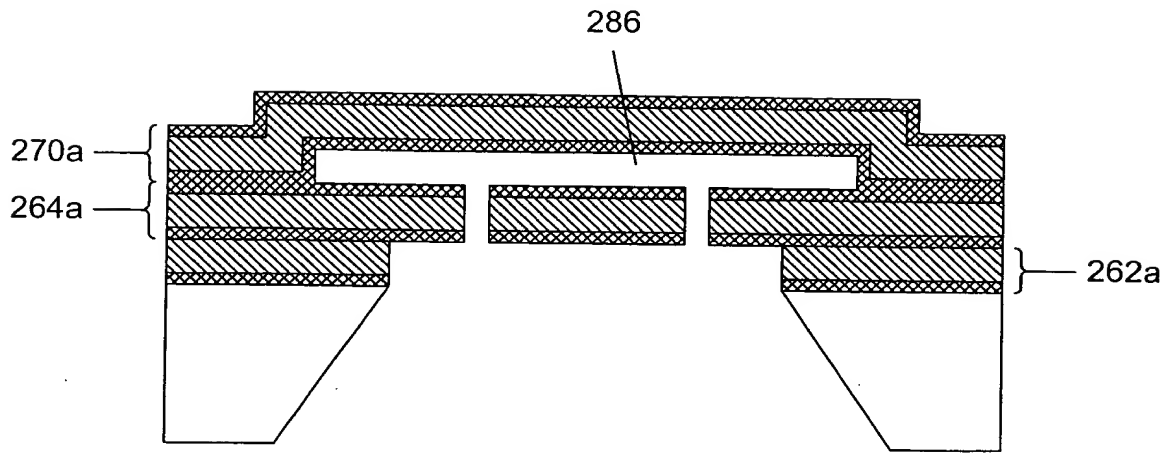


FIG. 4D

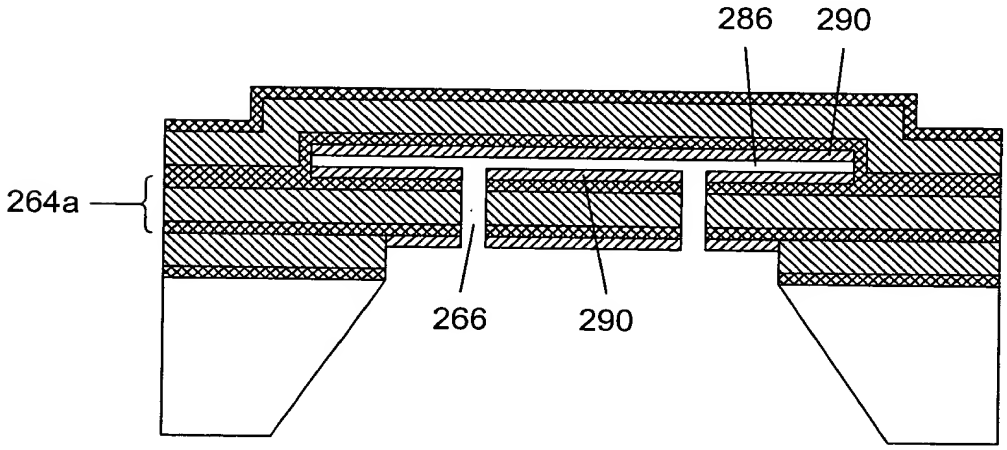


FIG. 4E

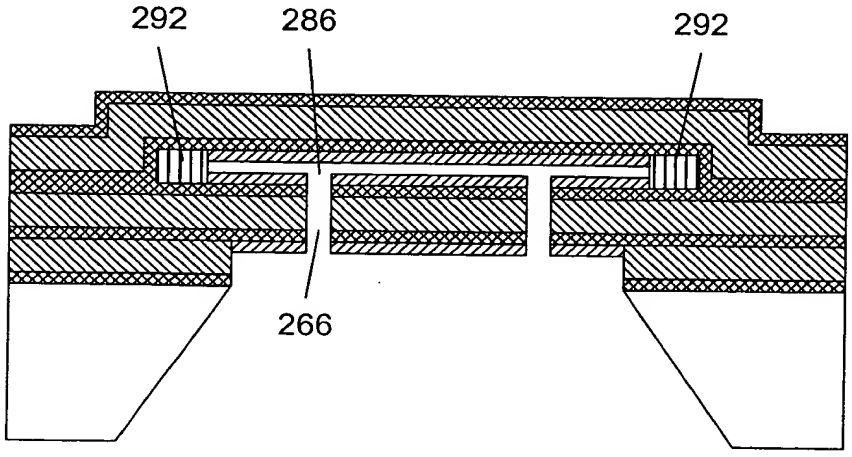


FIG. 4F

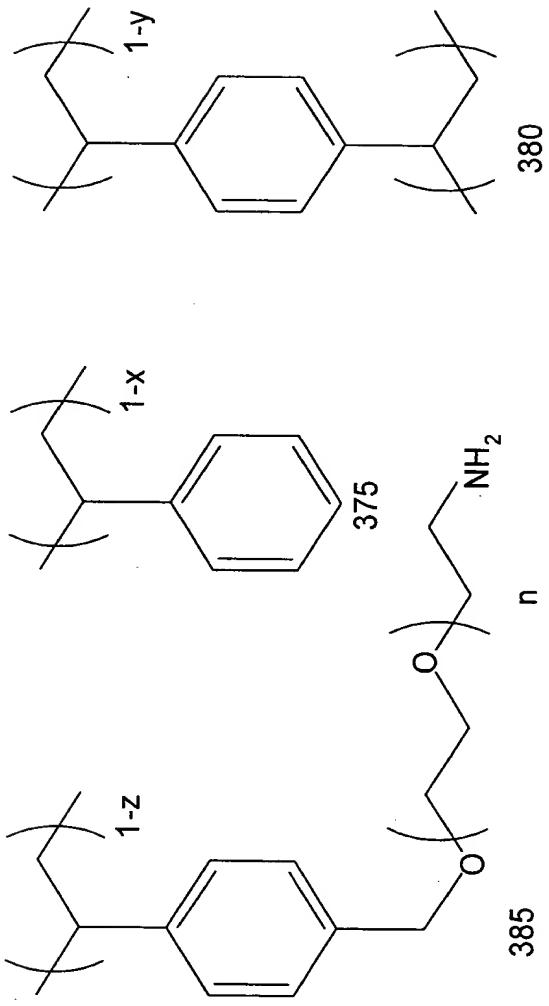
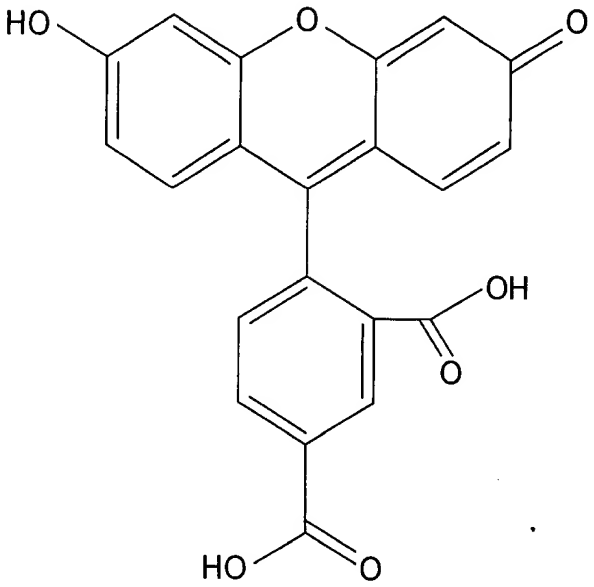
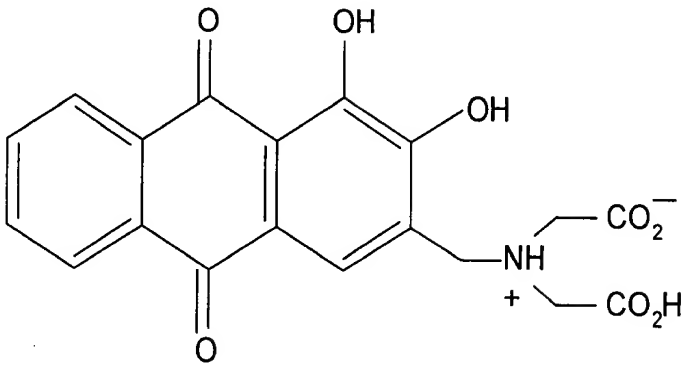


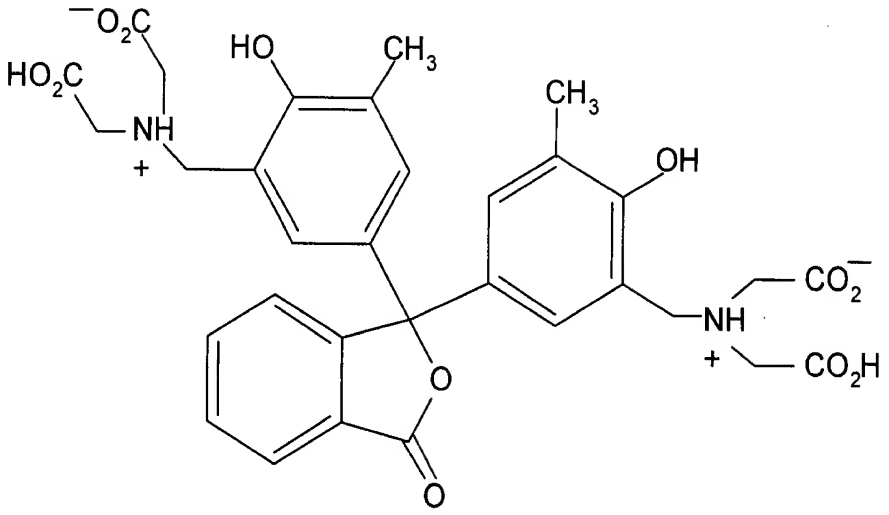
FIG. 5



5-carboxy fluorescein



alizarin complexone



o-cresolphthalein complexone

FIG. 6

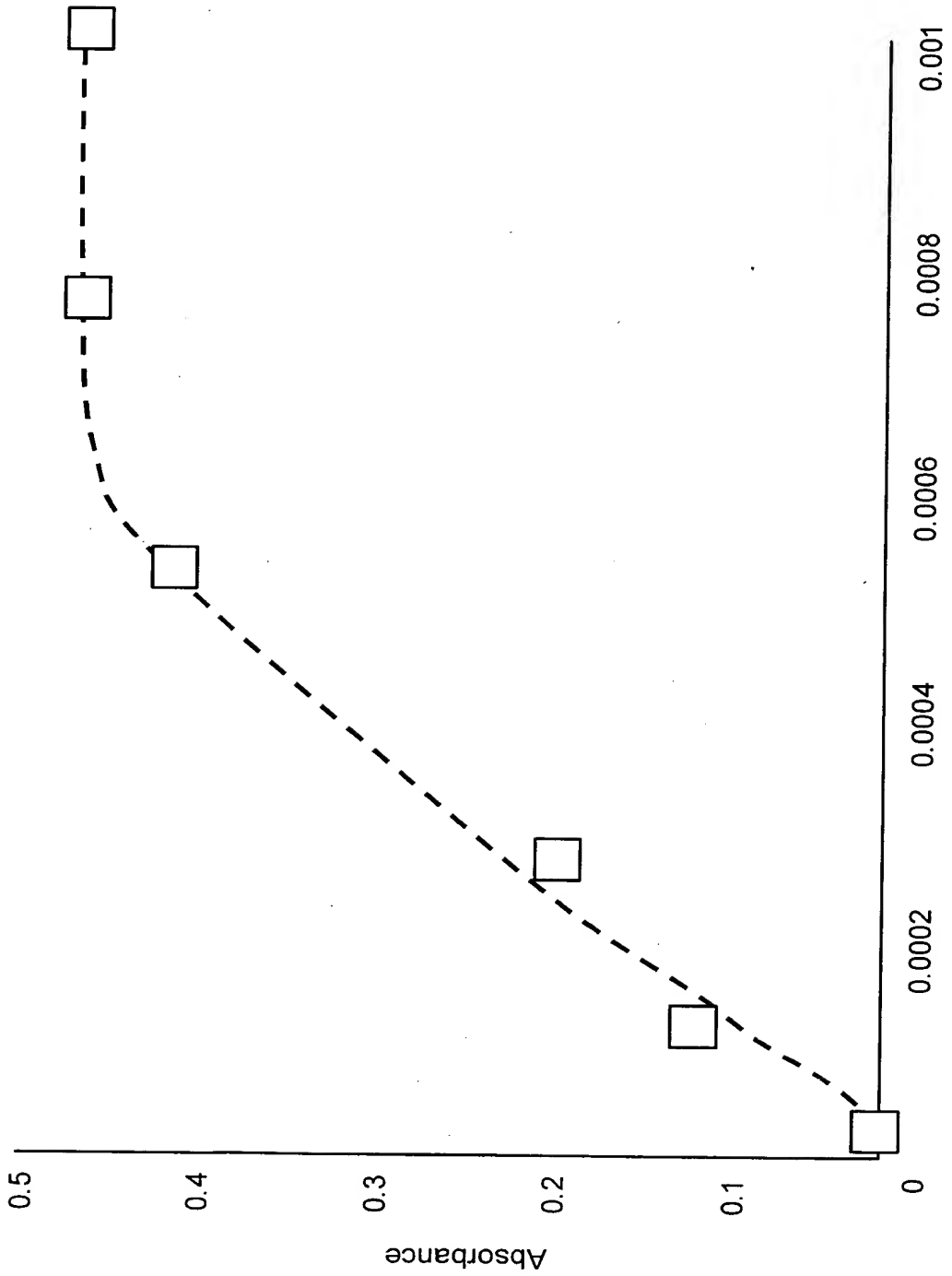

Absorbance
0.5
0.4
0.3
0.2
0.1
0
0.0002
0.0004
0.0006
0.0008
0.001
Concentration (M)

FIG. 7

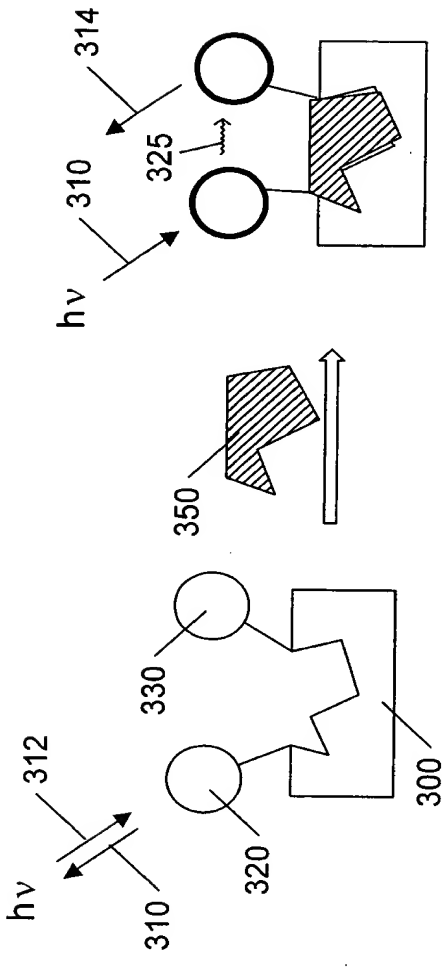


FIG. 8

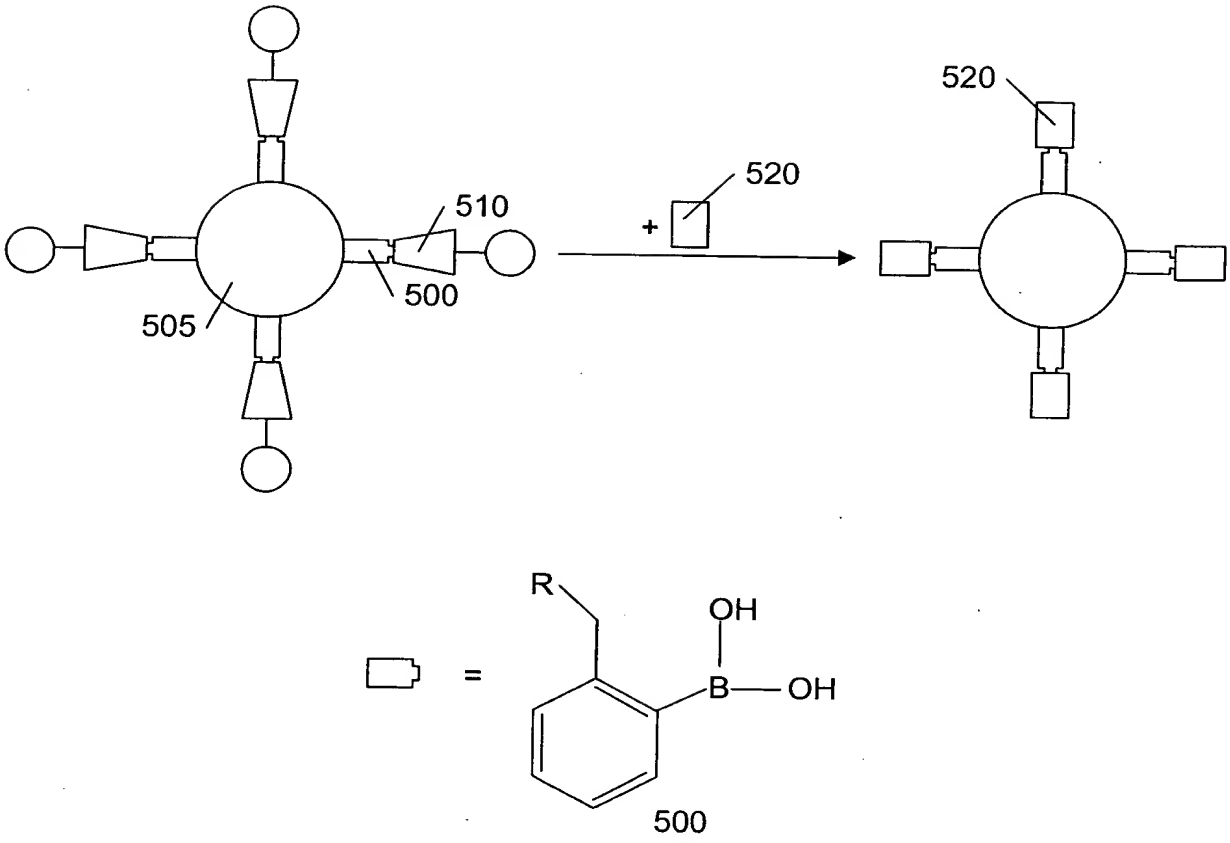
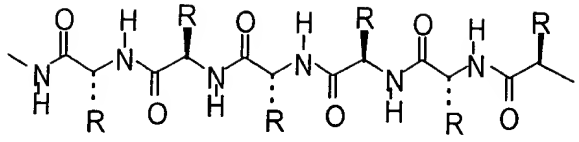
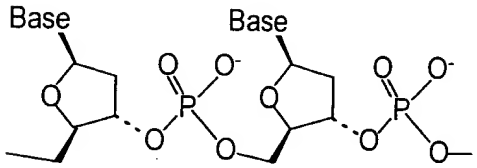

520
520
510
+
500
505
R
OH
B
OH
=
500
HO
OH
O
O
OH
OH
O
O
N
=
510
HO
O
OH
OH
OH
OH
=
520

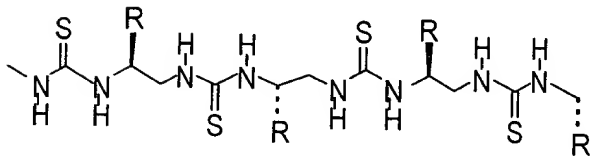
FIG. 9



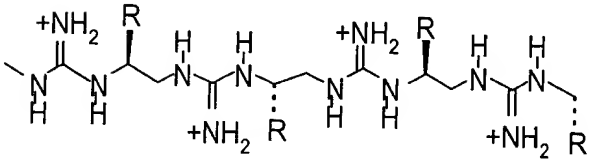
Peptides



Nucleotides



Polythioureas



Polyguanidiniums

FIG. 10

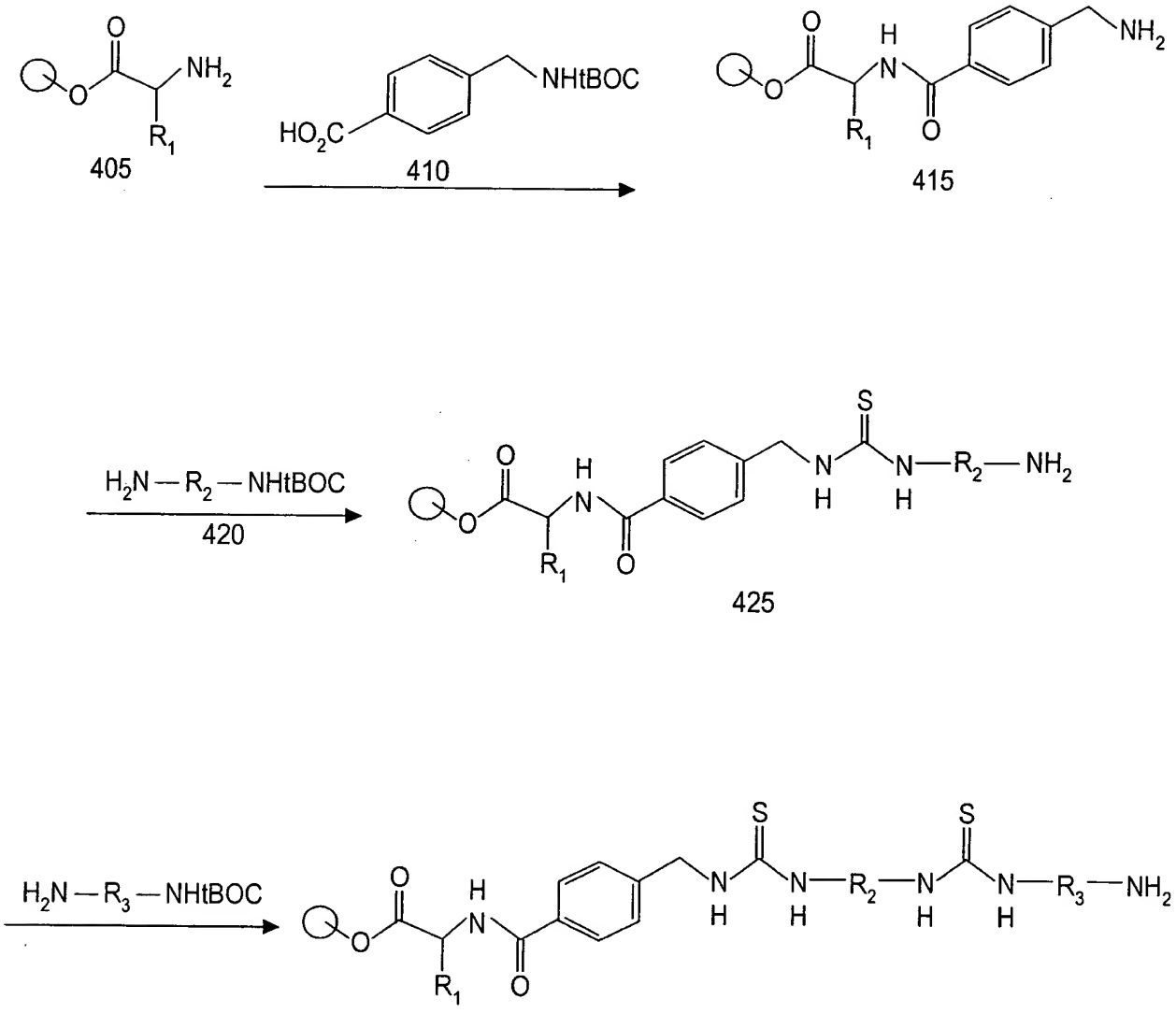


FIG. 11

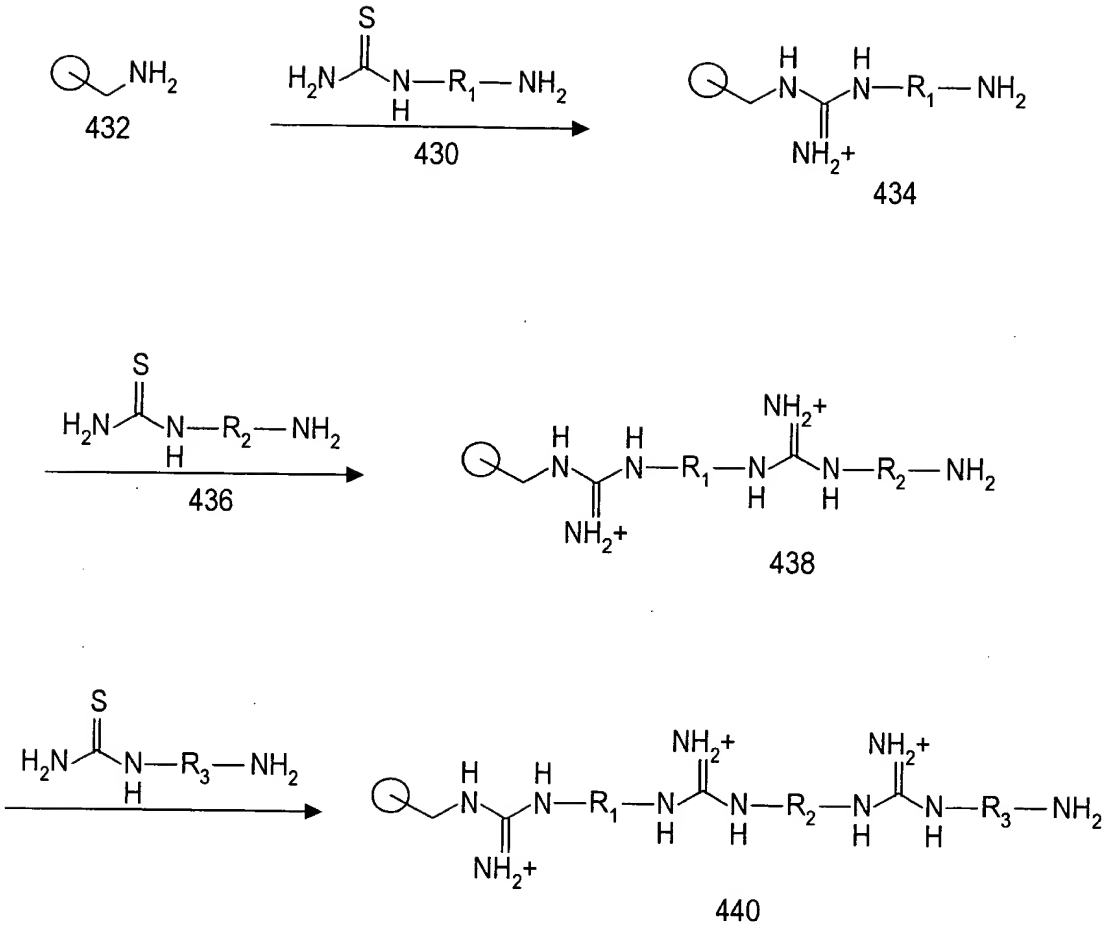

NH2
432
S
H2N
N—R1—NH2
H
430
H
N
N—R1—NH2
NH2+
434
S
H2N
N—R2—NH2
H
436
NH2+
438
S
H2N
N—R3—NH2
H
NH2+
440

FIG. 12

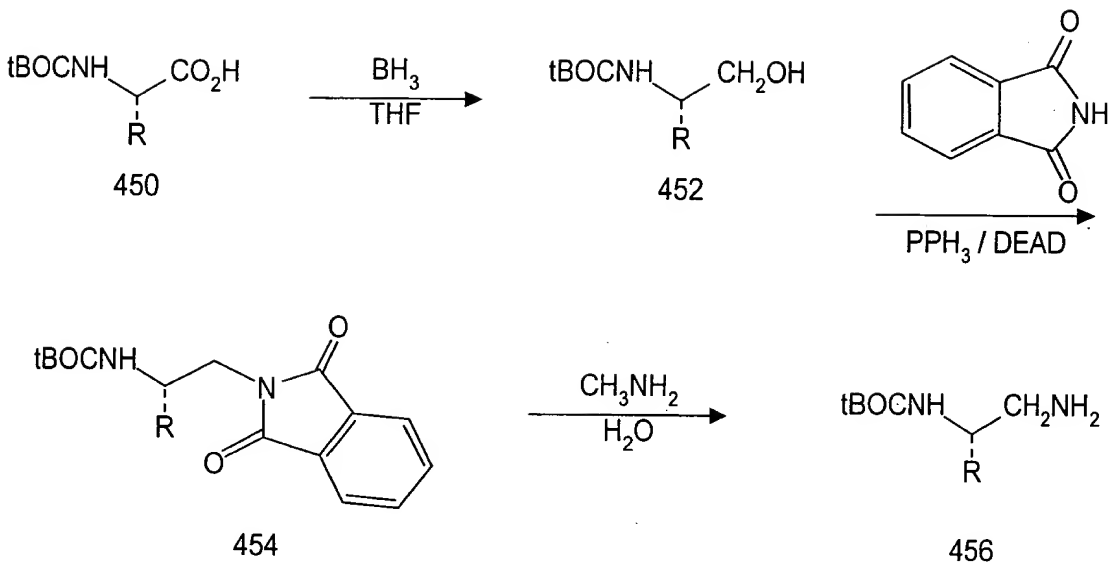

tBOCNH
CO2H
R
450
BH3
THF
tBOCNH
CH2OH
R
452
O
NH
O
PPH3 / DEAD
tBOCNH
R
N
O
O
454
CH3NH2
H2O
tBOCNH
CH2NH2
R
456

FIG. 13

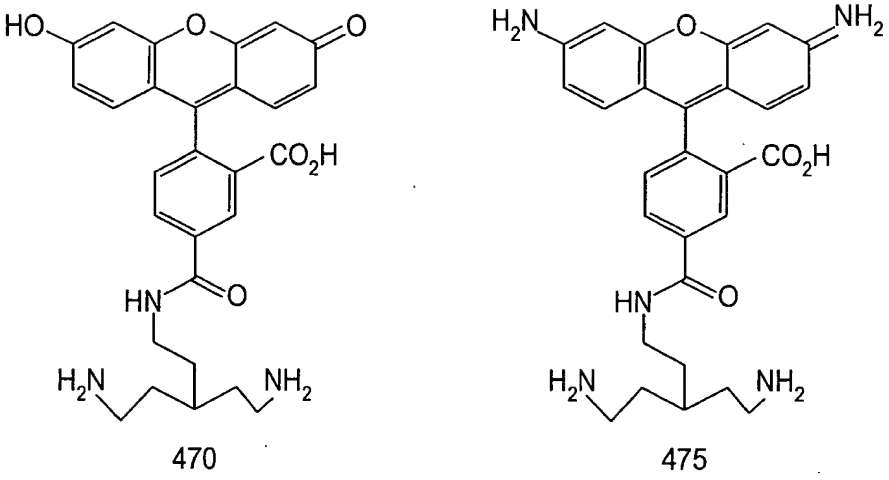


FIG. 14

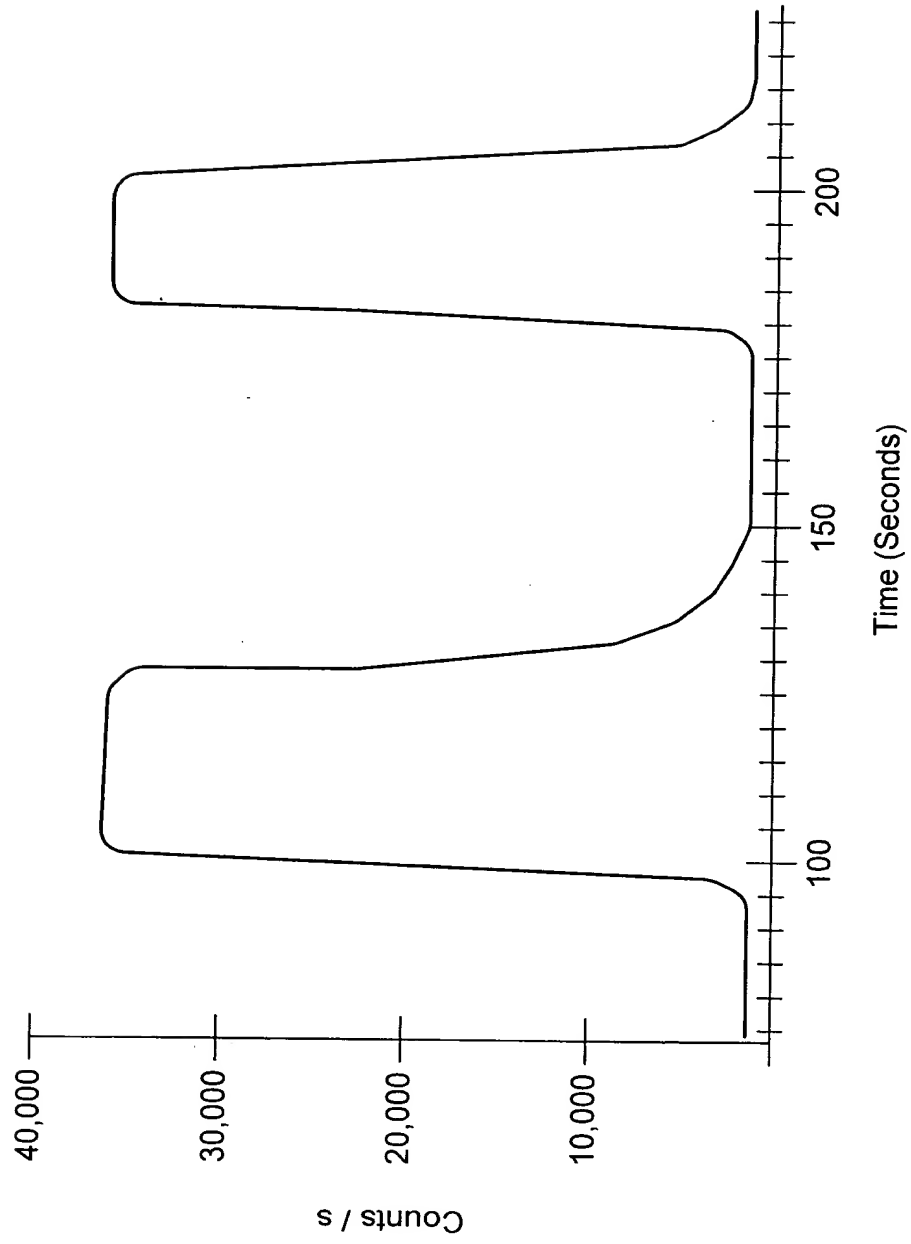


FIG. 15

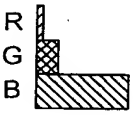
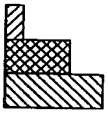
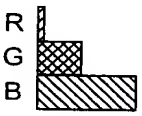
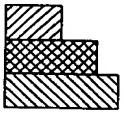
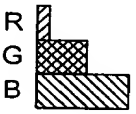
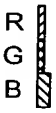
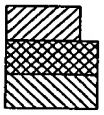
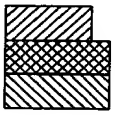
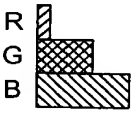
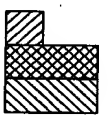
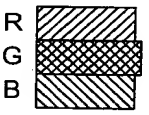
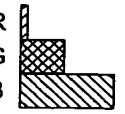
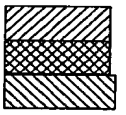
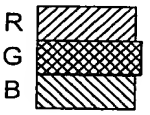
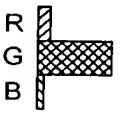
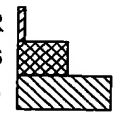
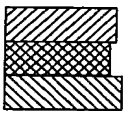
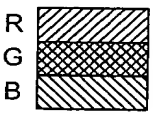
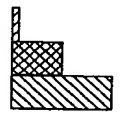
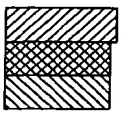
RESIN: pH	Ion	Blank	Alizarin	o-Cresol-phthalein	Fluorescein	Alizarin-Ce^{3+} complex
2	none					
2	Ca^{2+}					
7	none					
7	Ca^{2+}					
7	F^-					
12	none					
12	Ca^{2+}					
12	F^-					

FIG. 16

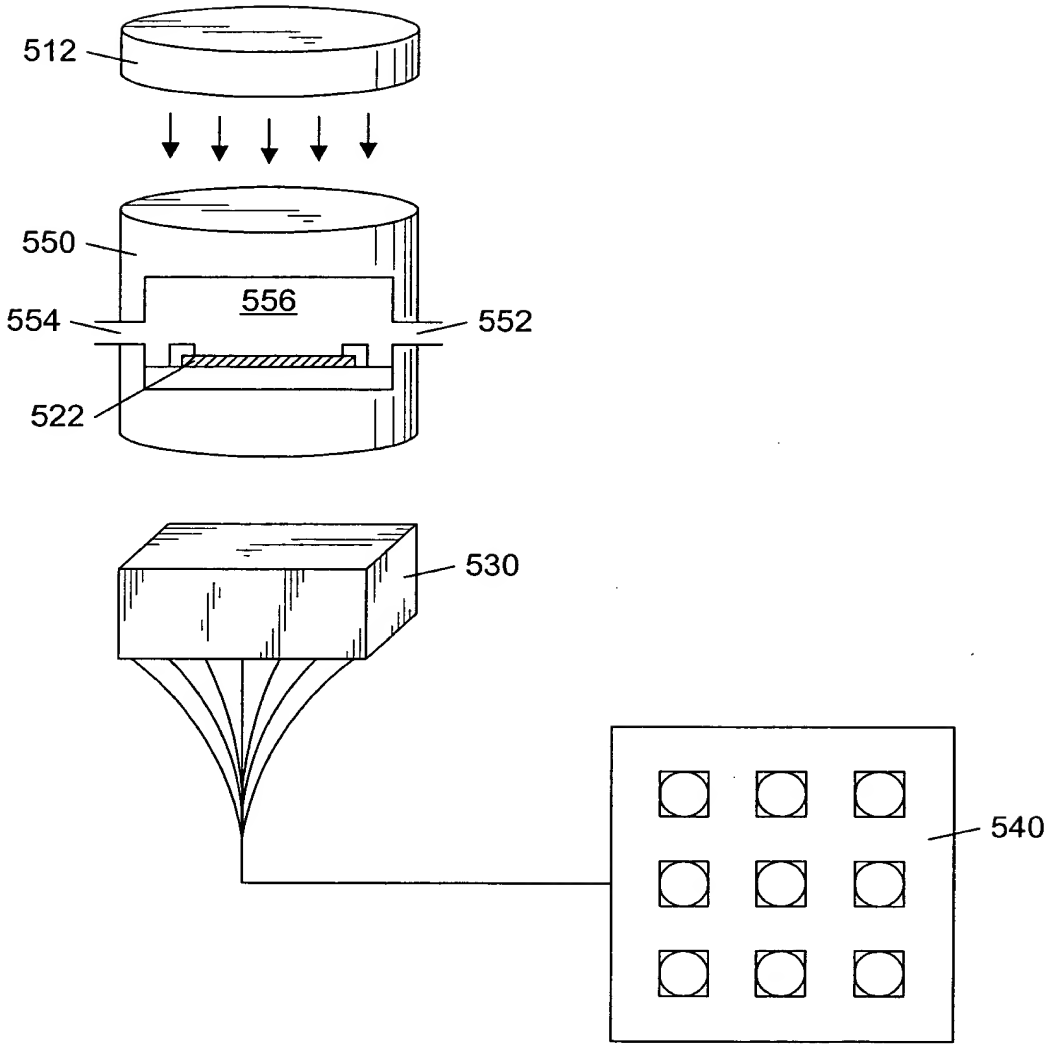


FIG. 17

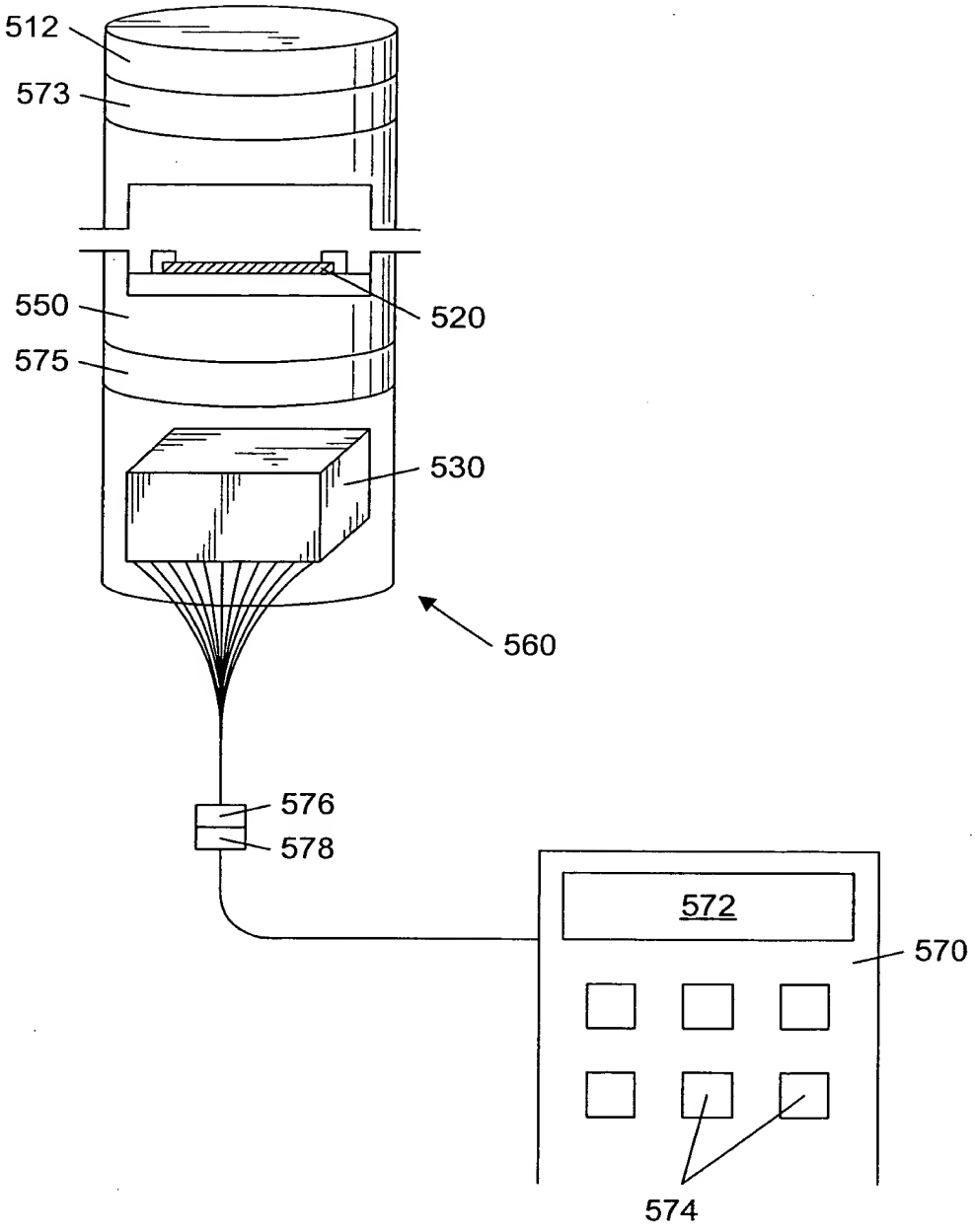


FIG. 18

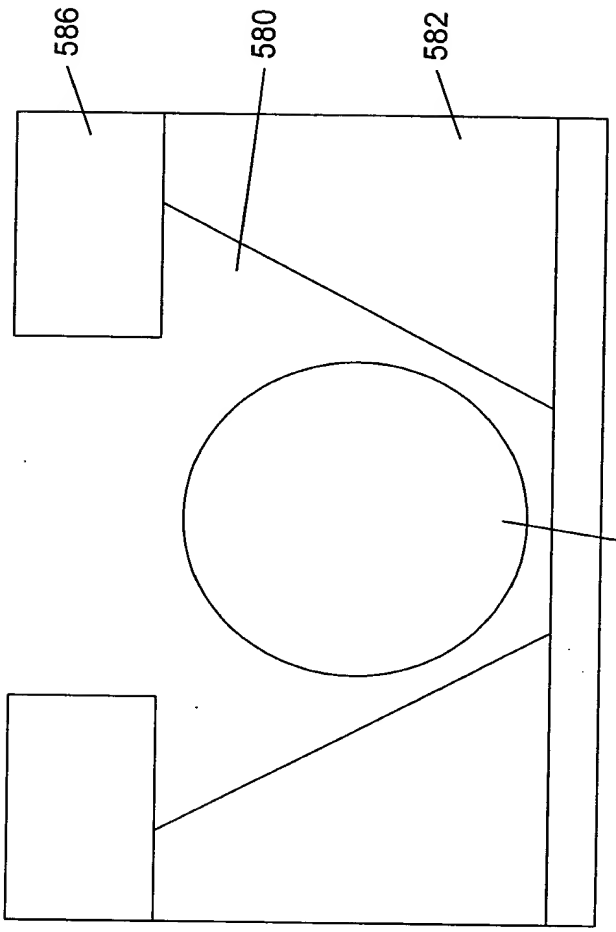


FIG. 19

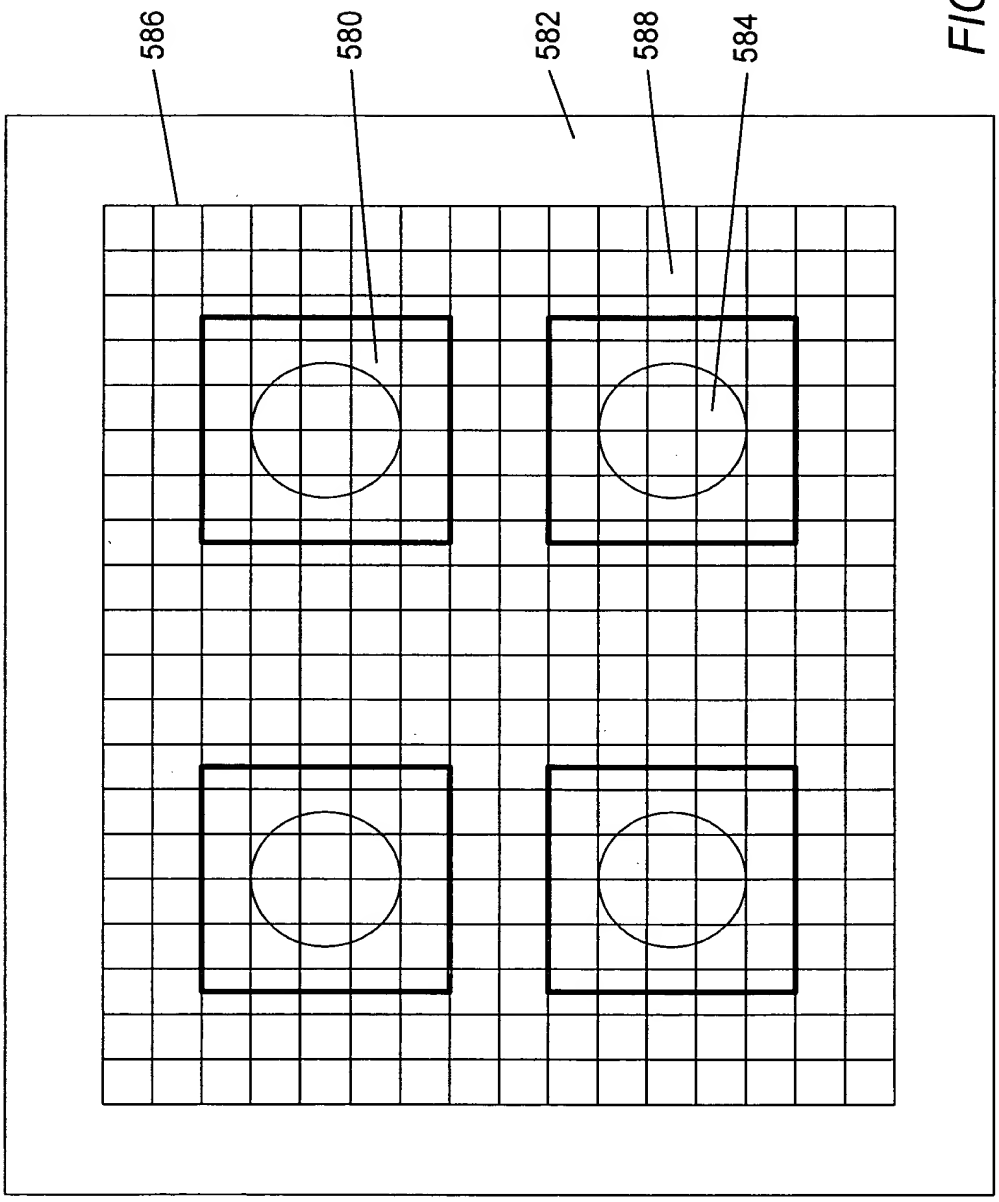


FIG. 20

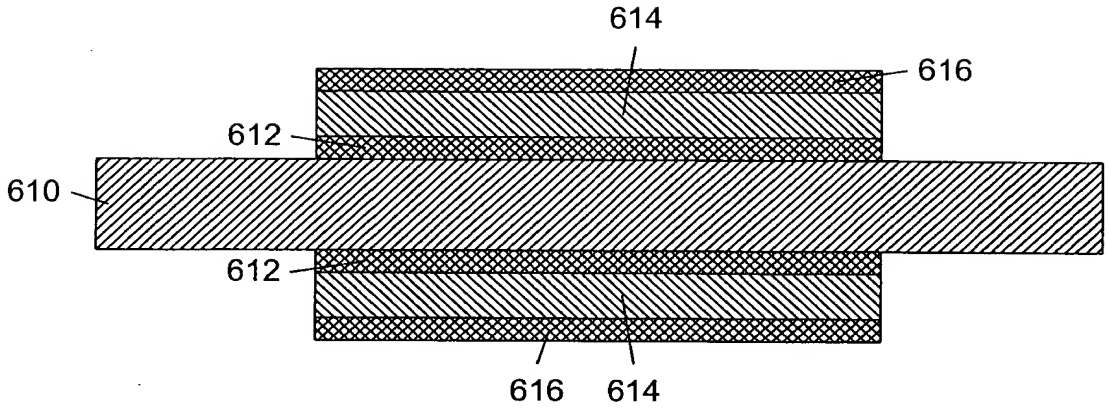


FIG. 21A

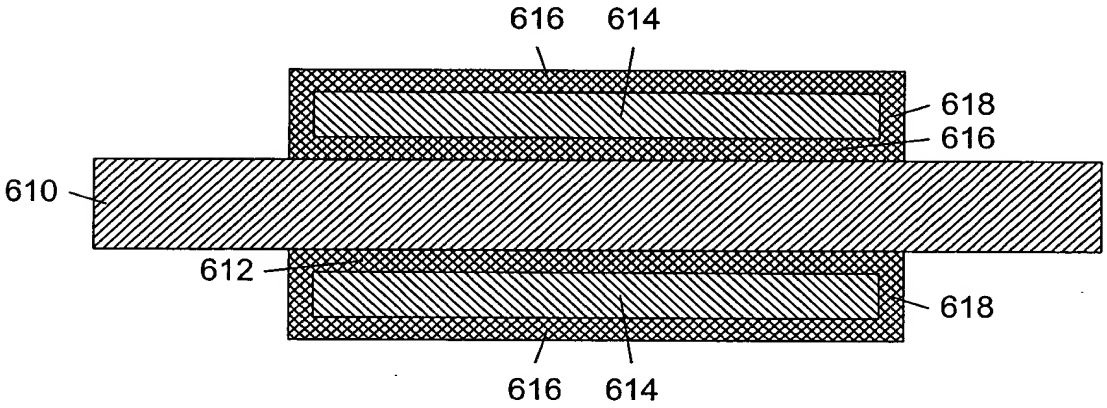


FIG. 21B

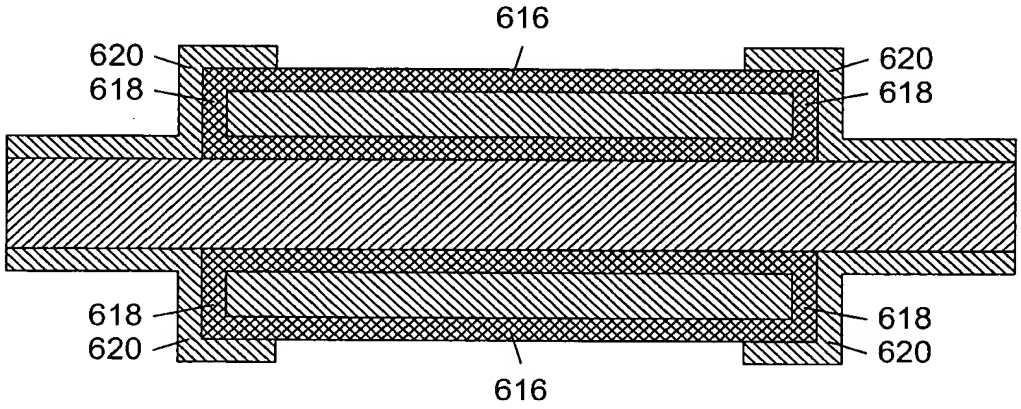


FIG. 21C

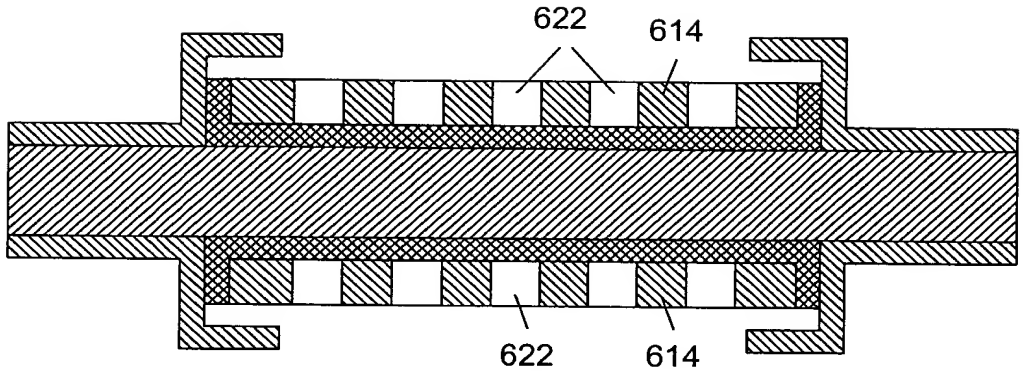


FIG. 21D

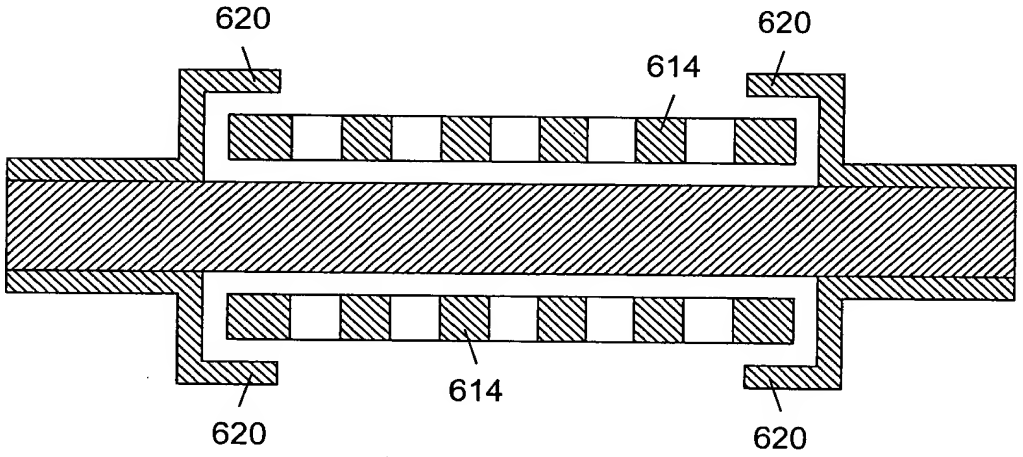


FIG. 21E

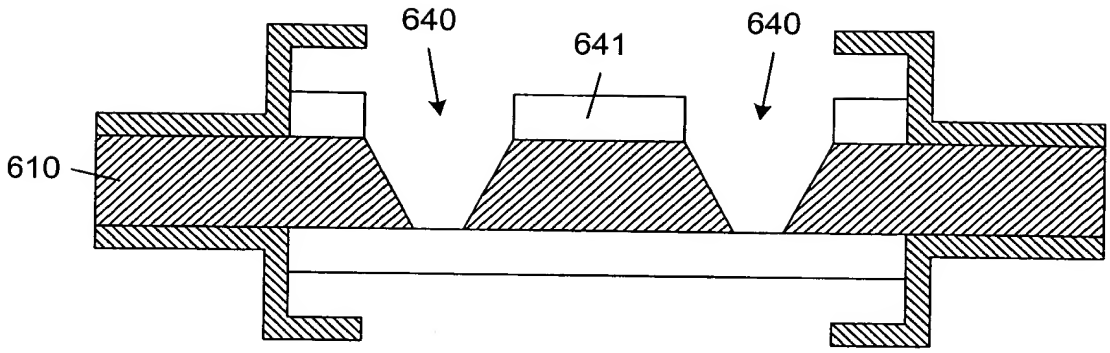


FIG. 21F

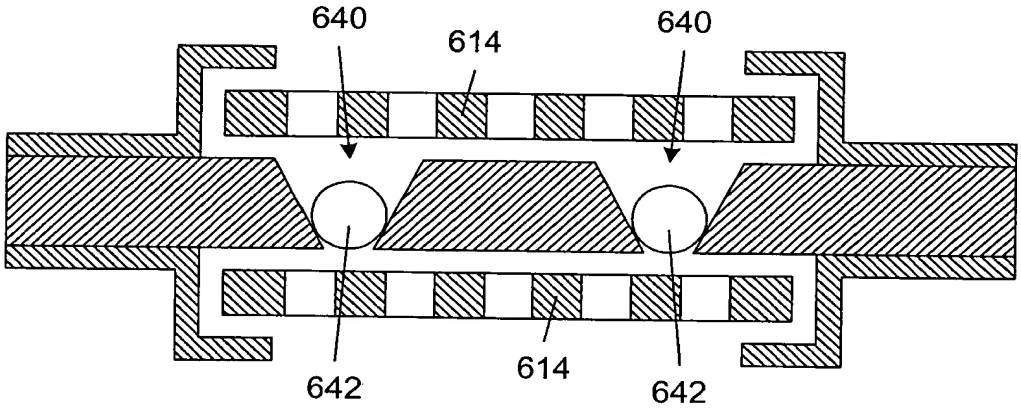


FIG. 21G

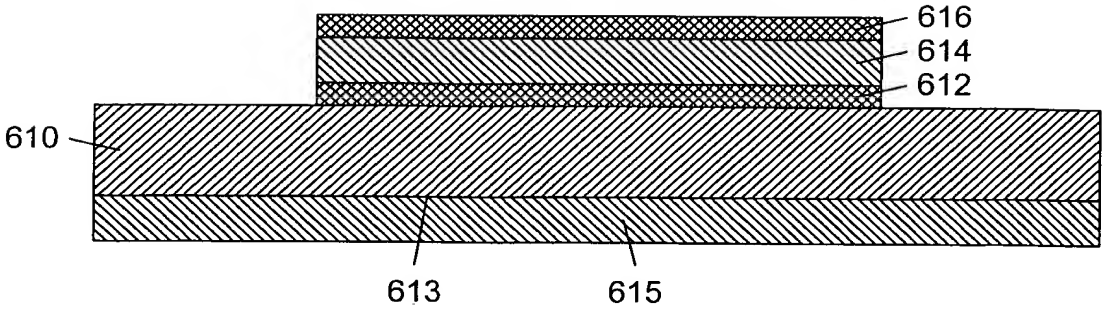


FIG. 22A

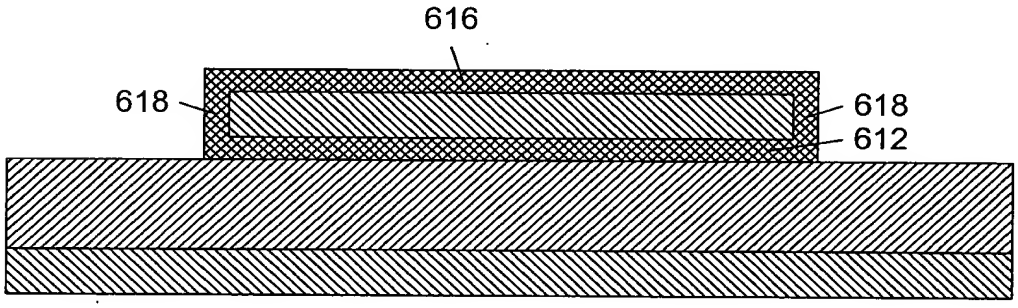


FIG. 22B

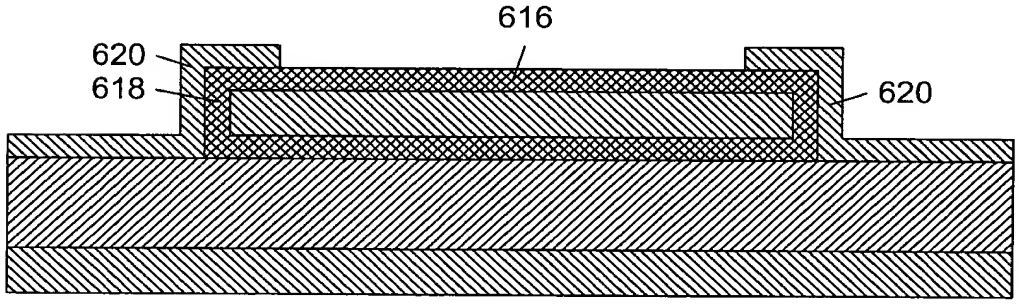


FIG. 22C

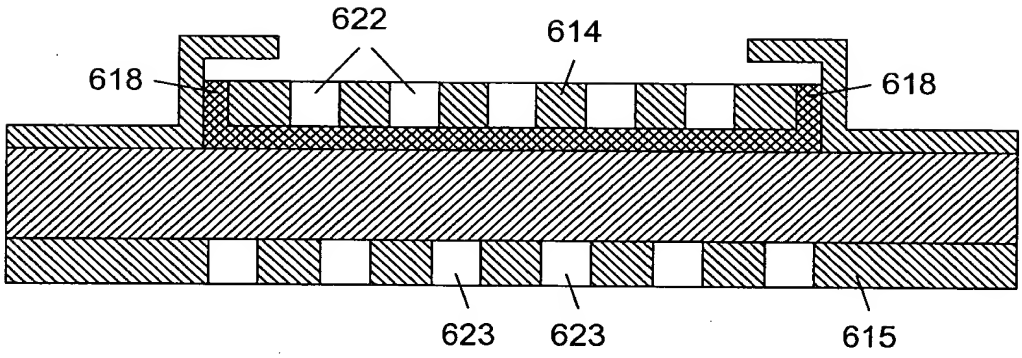


FIG. 22D

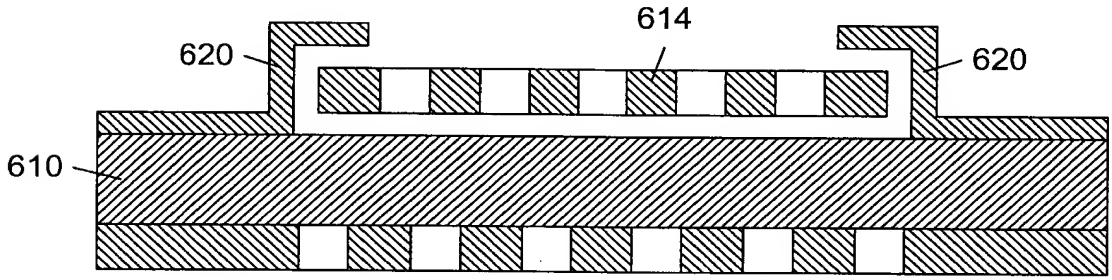


FIG. 22E

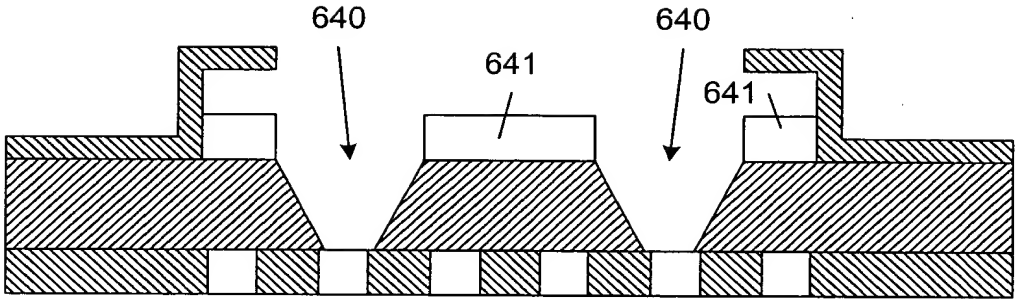


FIG. 22F

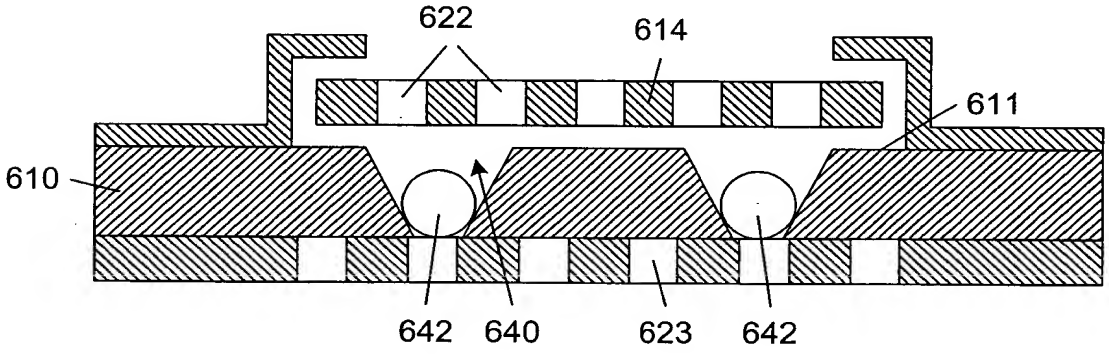


FIG. 22G

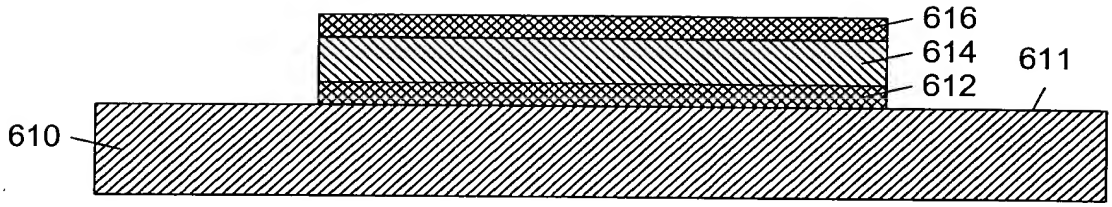


FIG. 23A

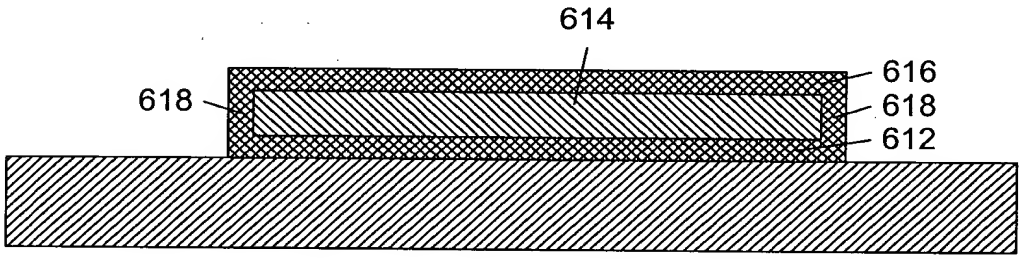


FIG. 23B

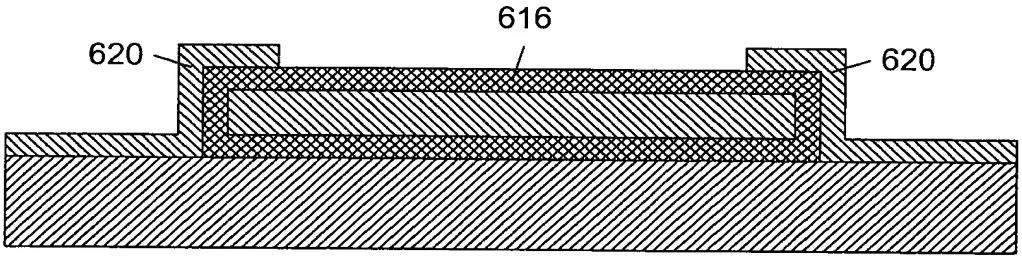


FIG. 23C

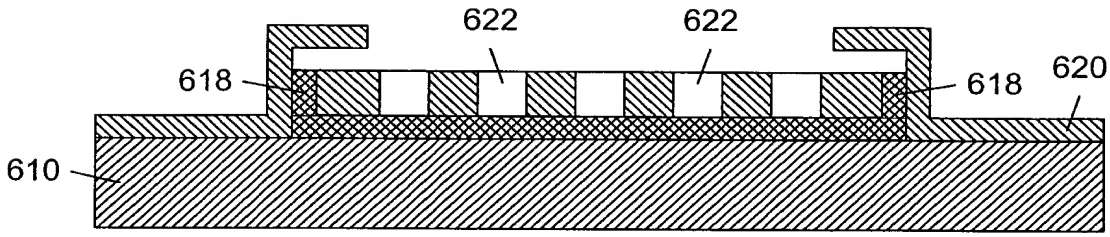


FIG. 23D

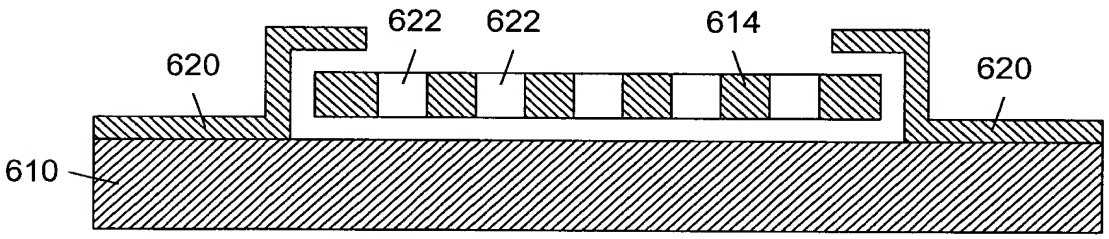


FIG. 23E

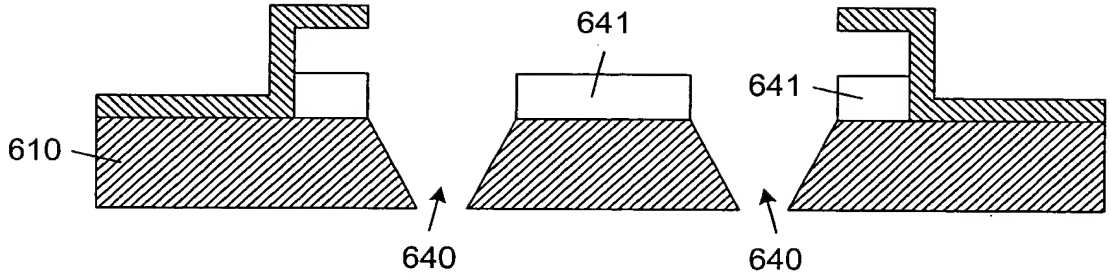


FIG. 23F

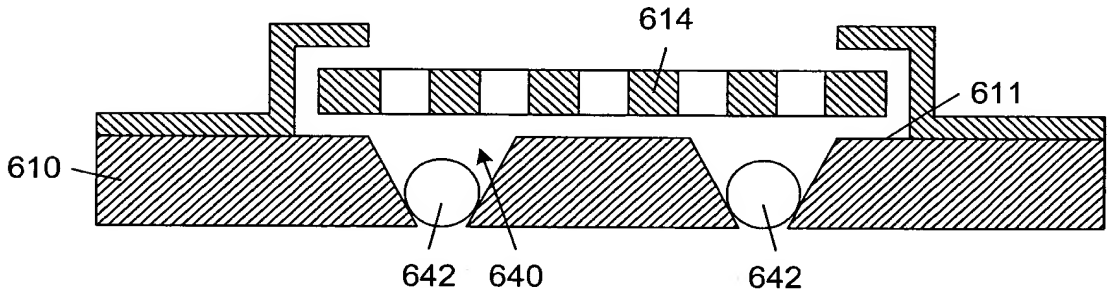


FIG. 23G

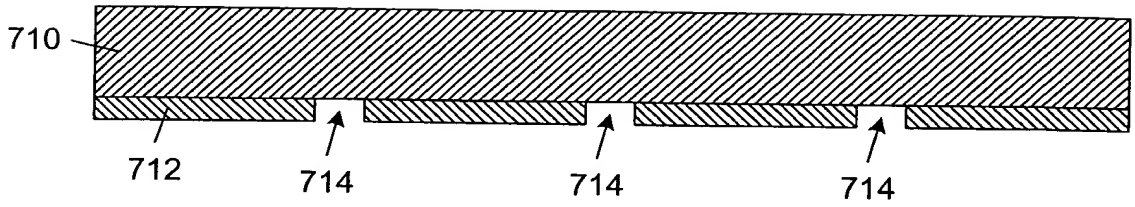


FIG. 24A

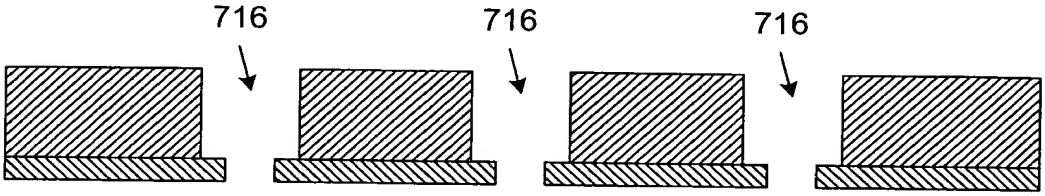


FIG. 24B

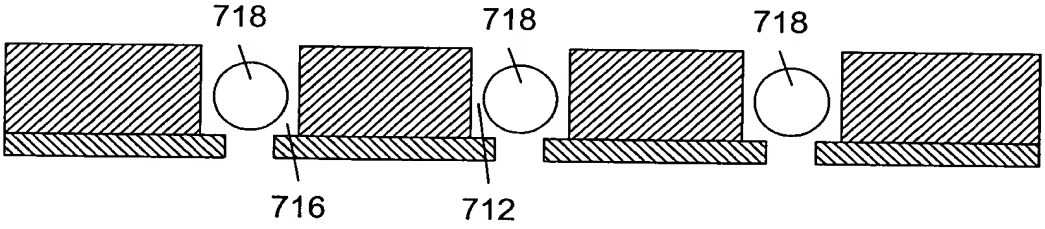


FIG. 24C

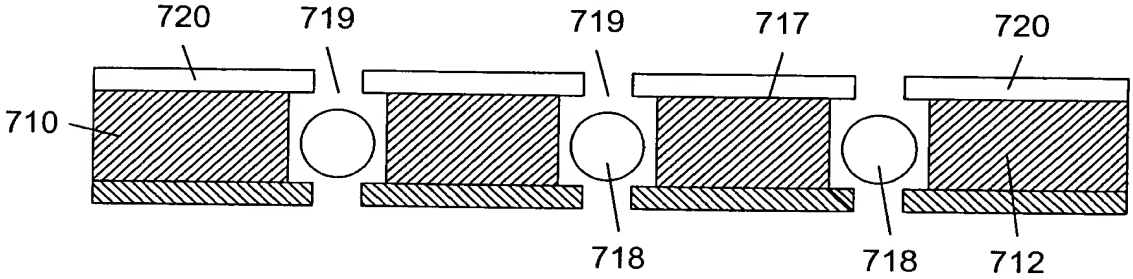


FIG. 24D

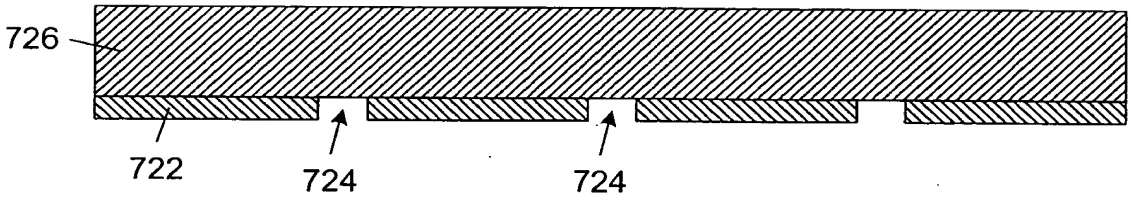


FIG. 25A

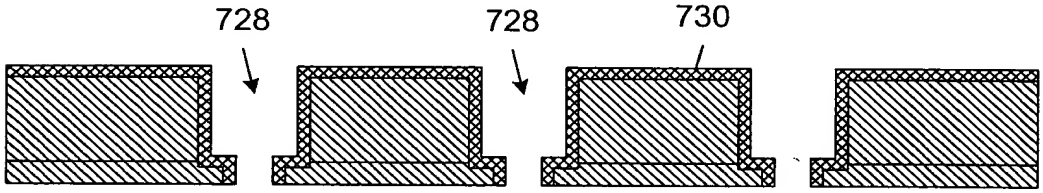


FIG. 25B

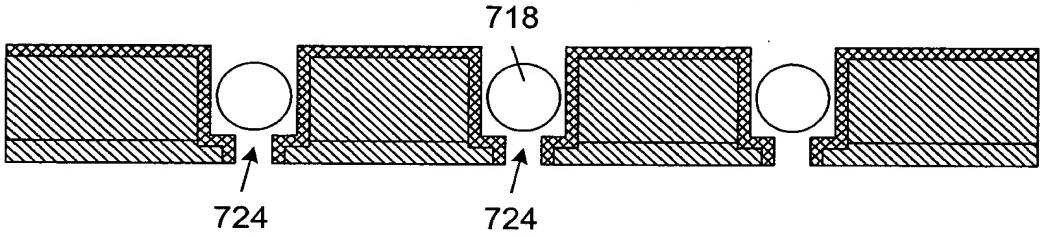


FIG. 25C

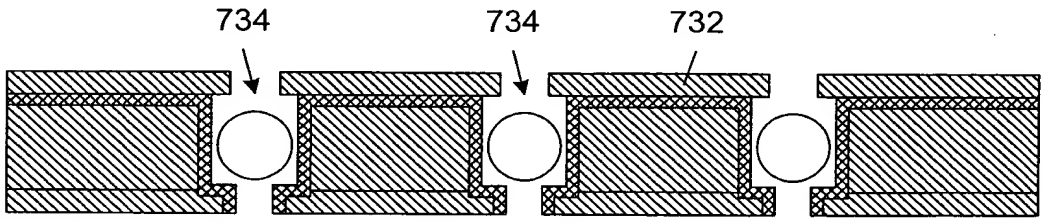


FIG. 25D

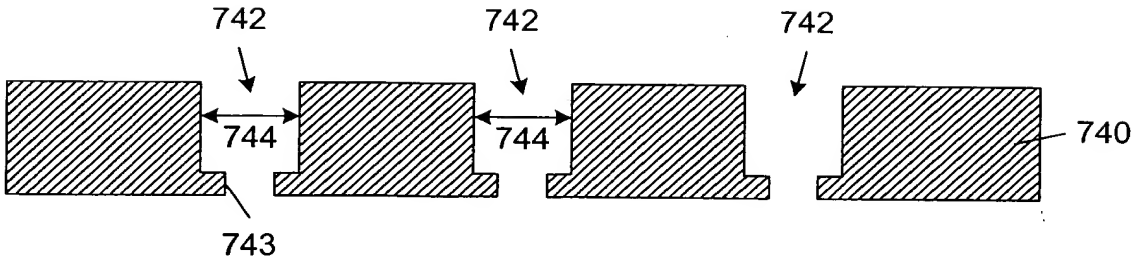


FIG. 26A

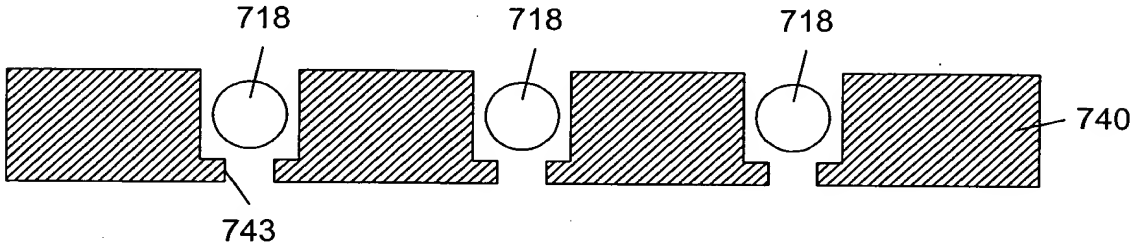


FIG. 26B

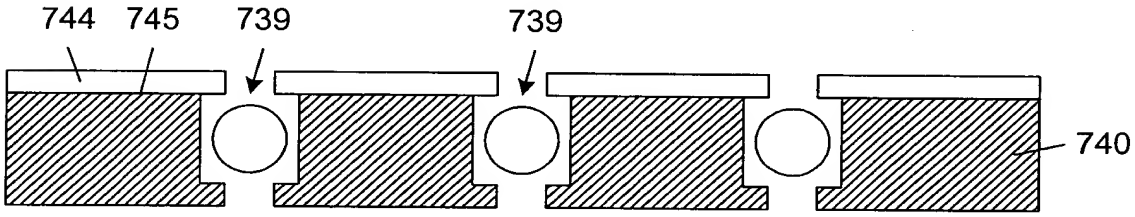


FIG. 26C

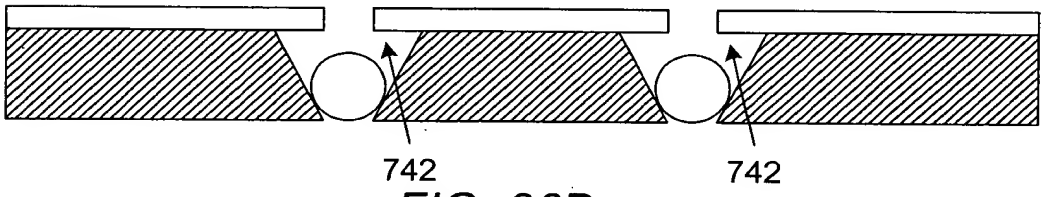


FIG. 26D

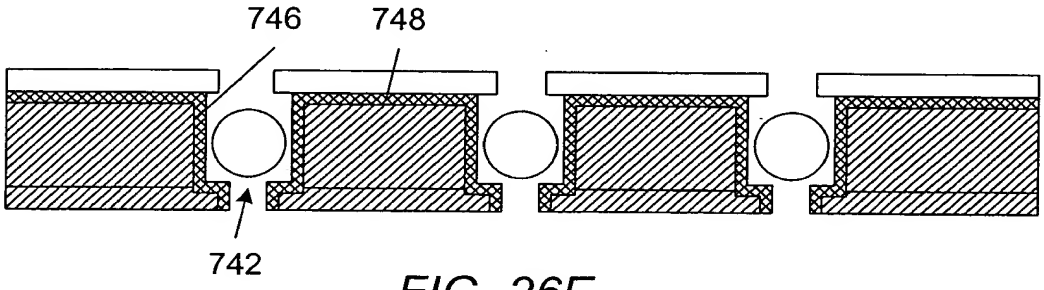


FIG. 26E

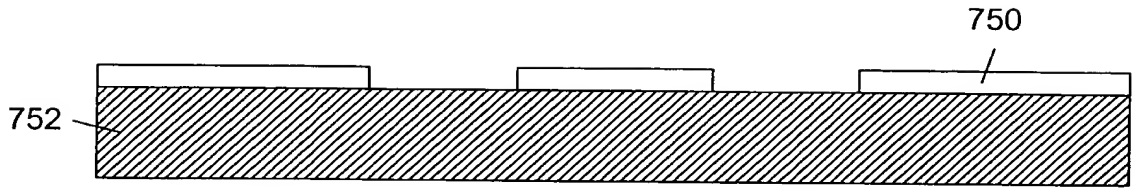


FIG. 27A

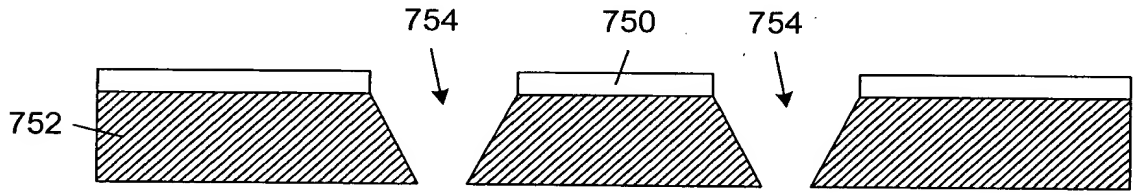


FIG. 27B

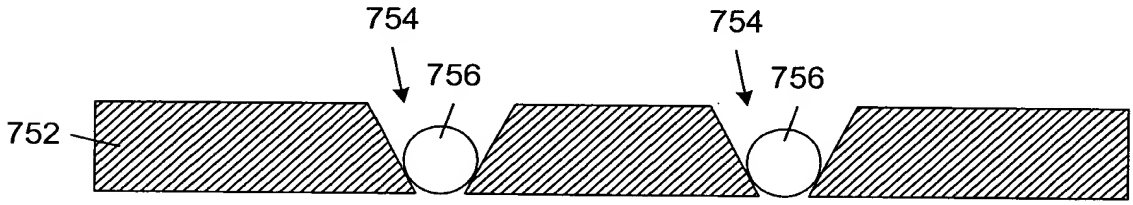


FIG. 27C

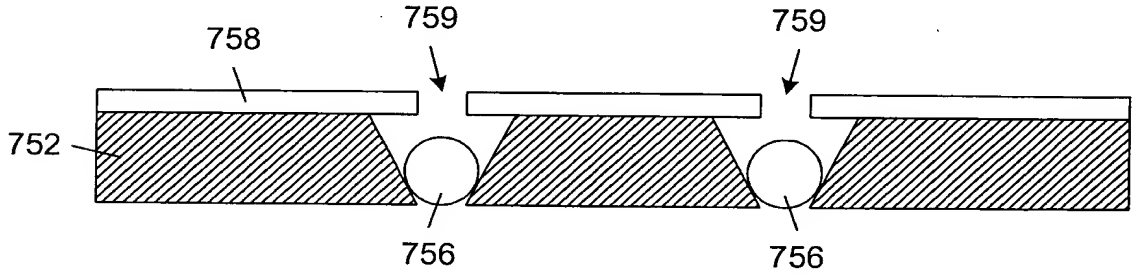


FIG. 27D

FIG. 28A

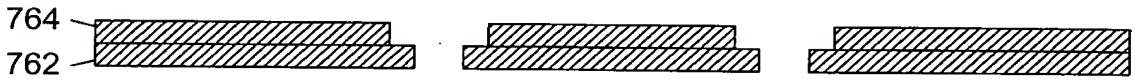


FIG. 28B

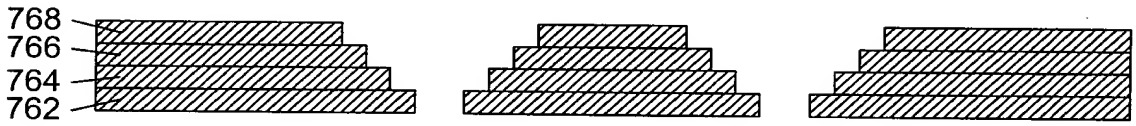


FIG. 28C

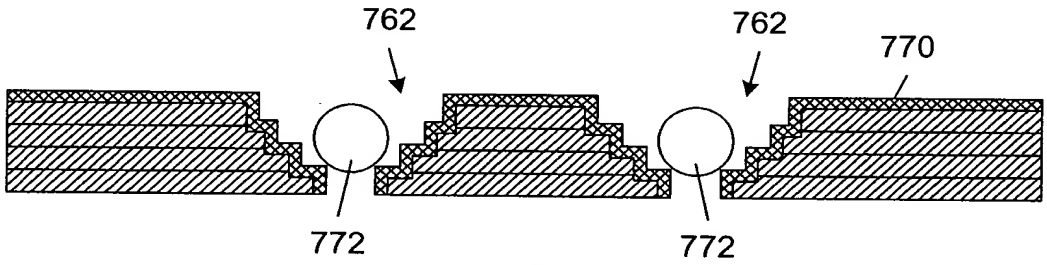


FIG. 28D

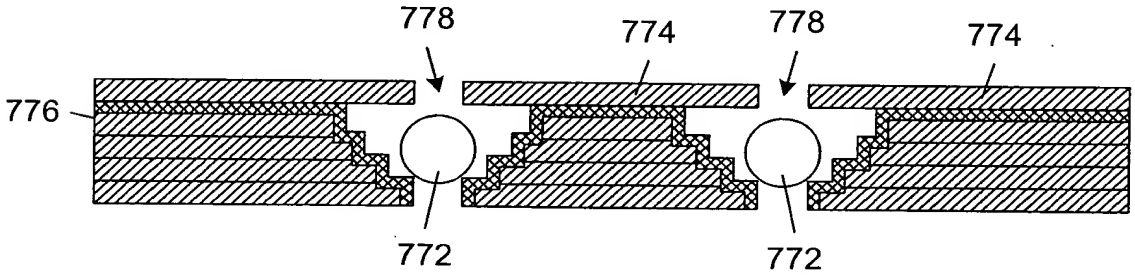


FIG. 28E

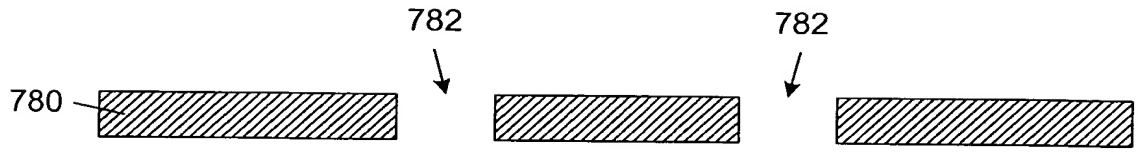


FIG. 29A

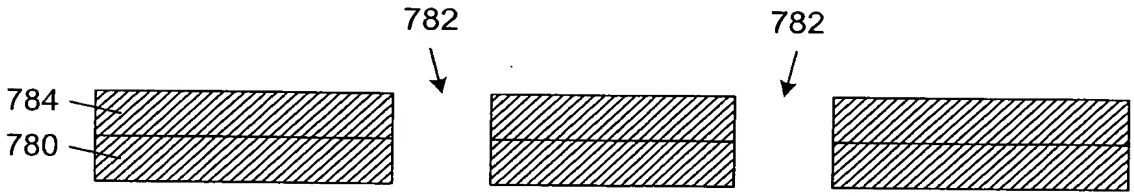


FIG. 29B

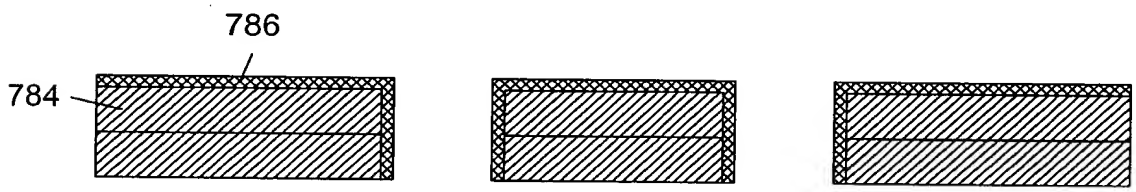


FIG. 29C

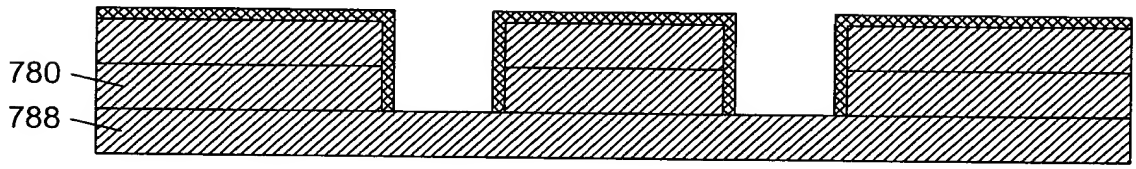


FIG. 29D

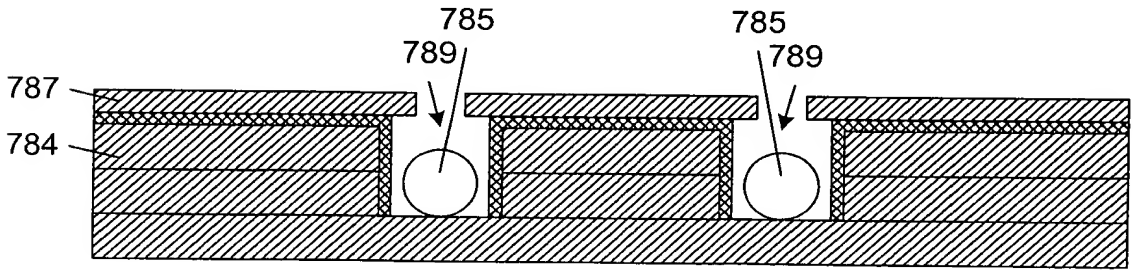


FIG. 29E

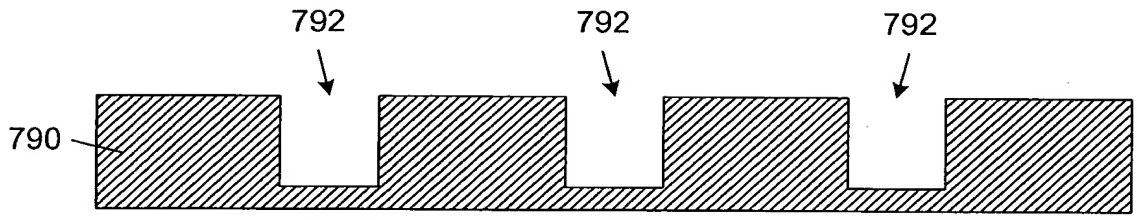


FIG. 30A

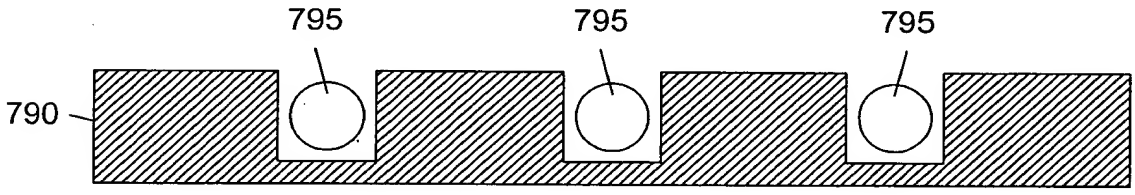


FIG. 30B

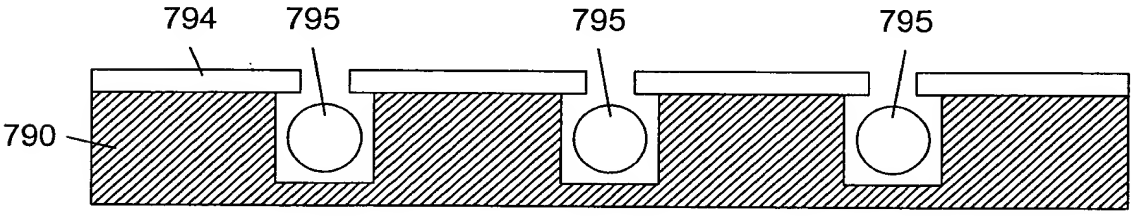


FIG. 30C

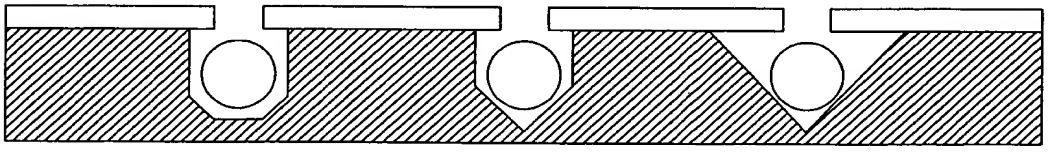


FIG. 30D

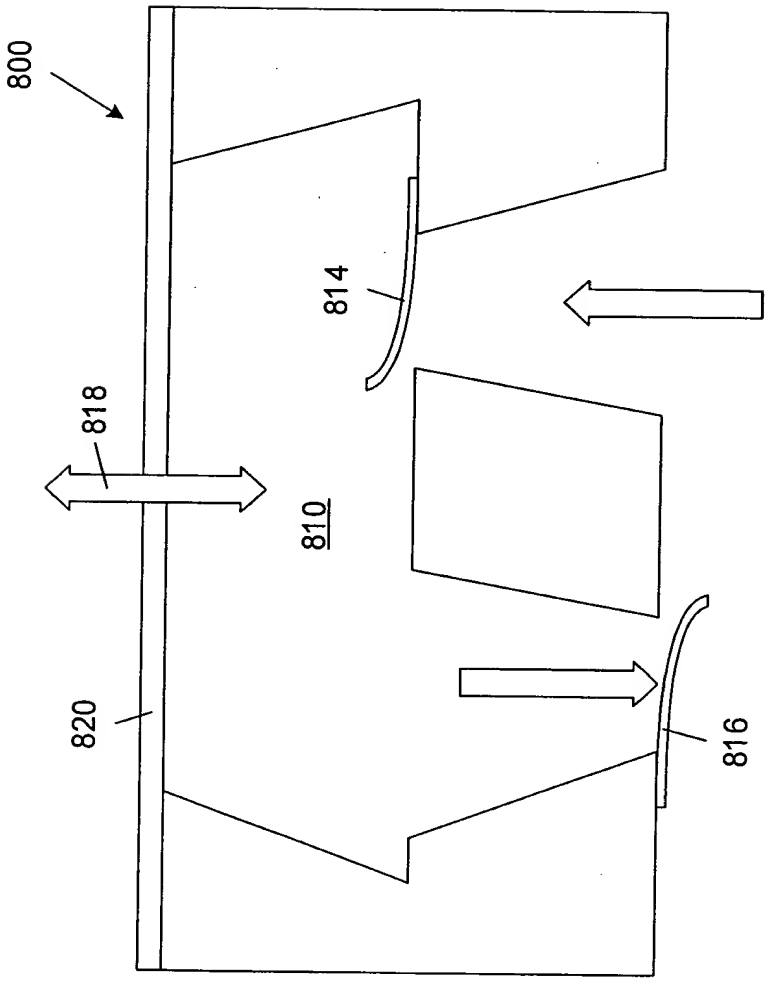


FIG. 31

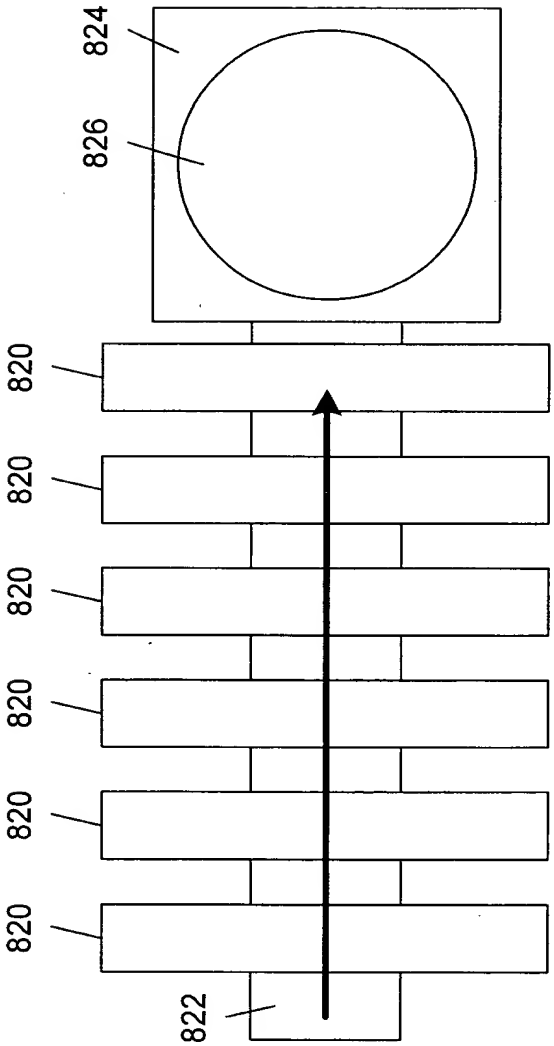


FIG. 32

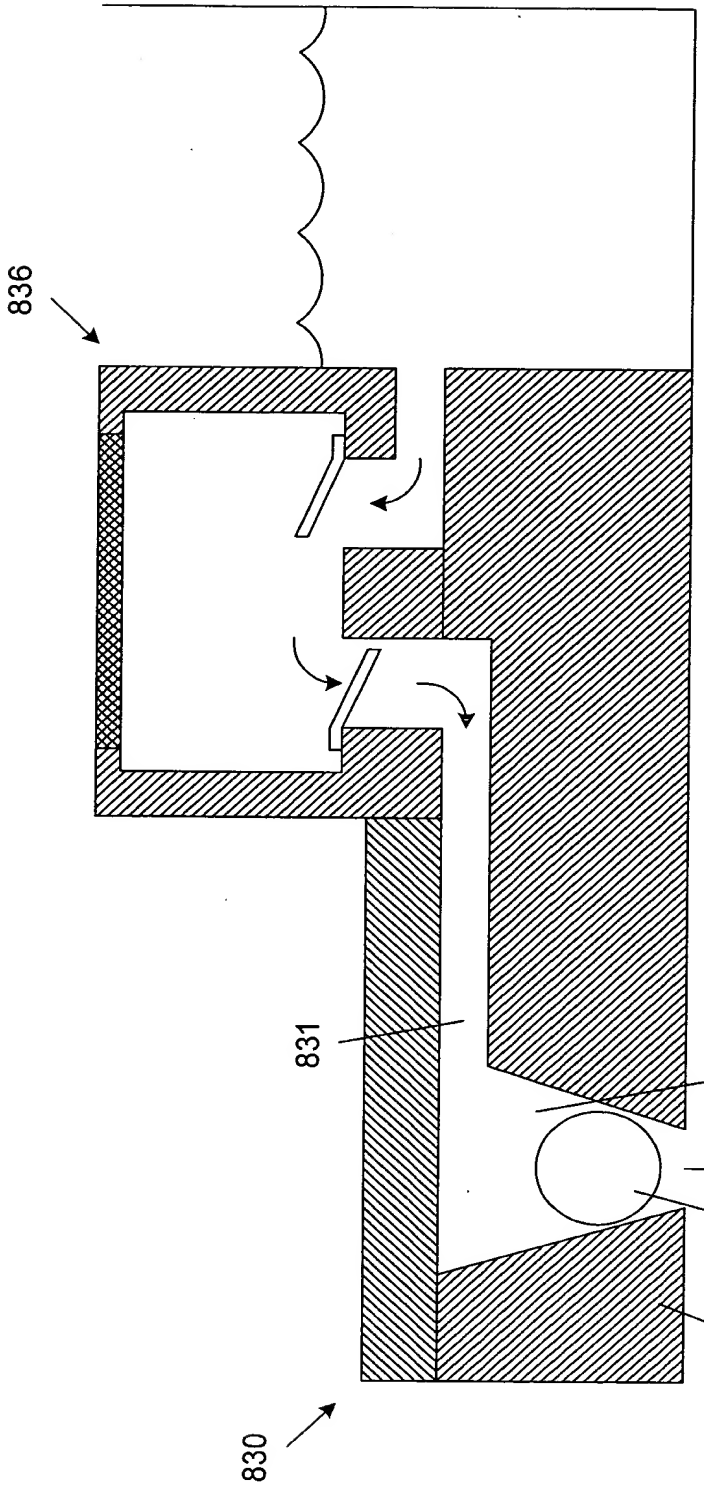


FIG. 33

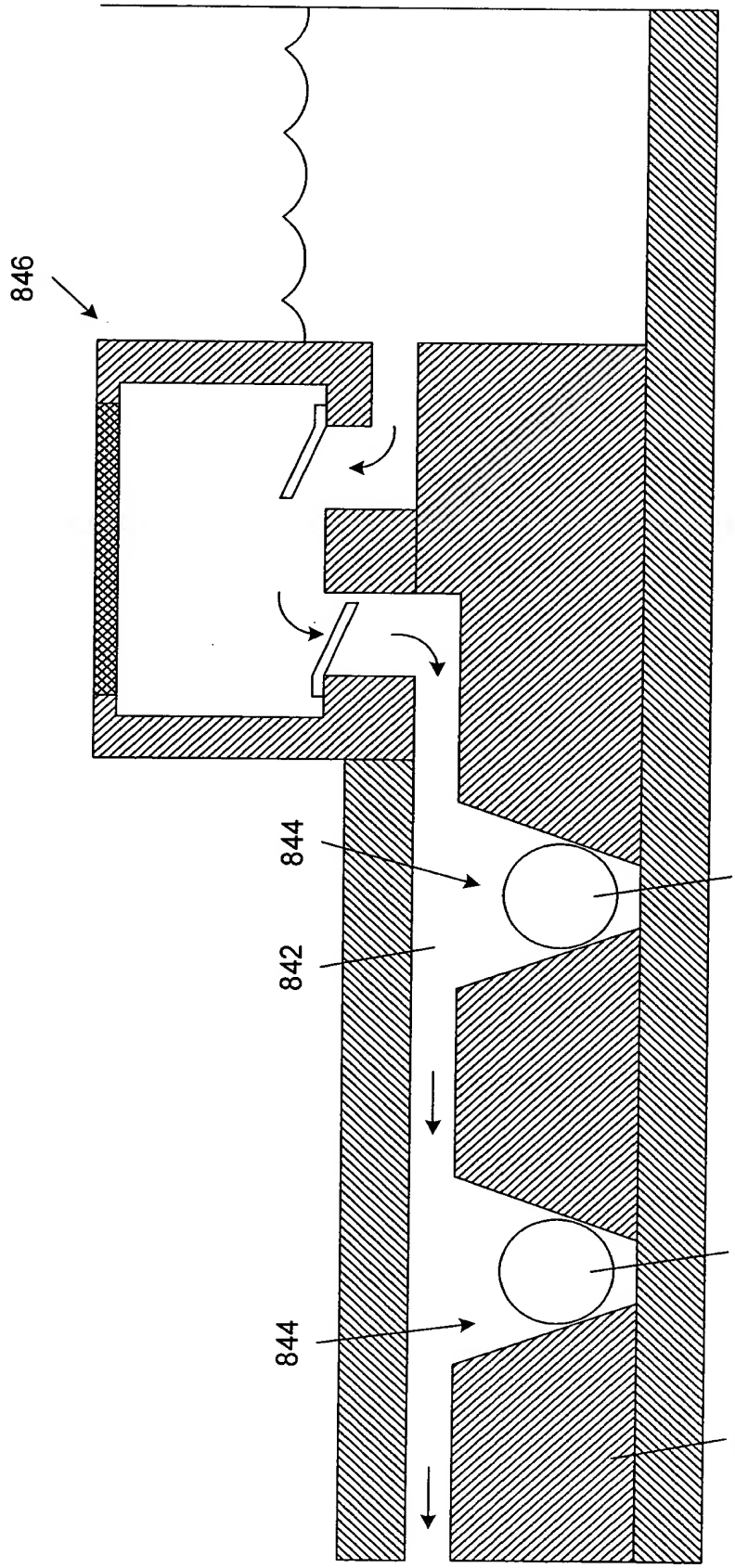


FIG. 34

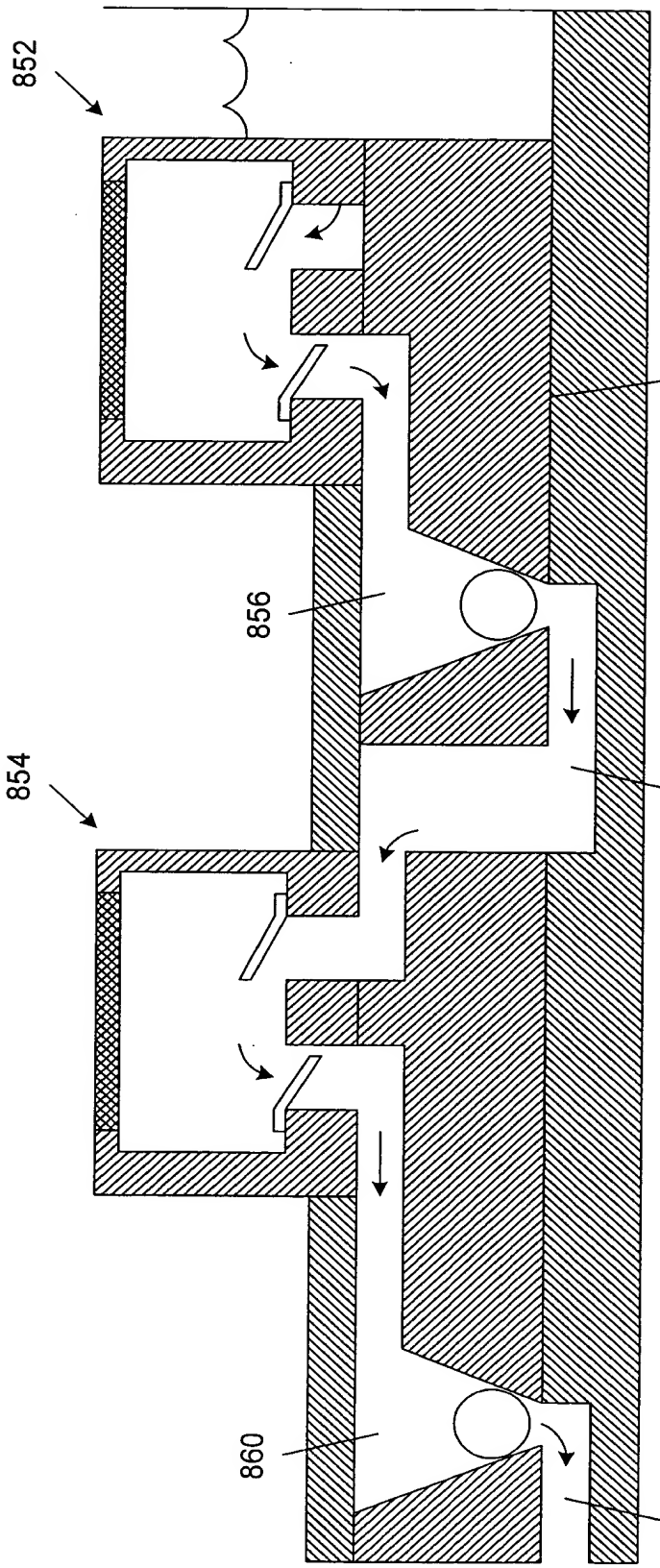


FIG. 35

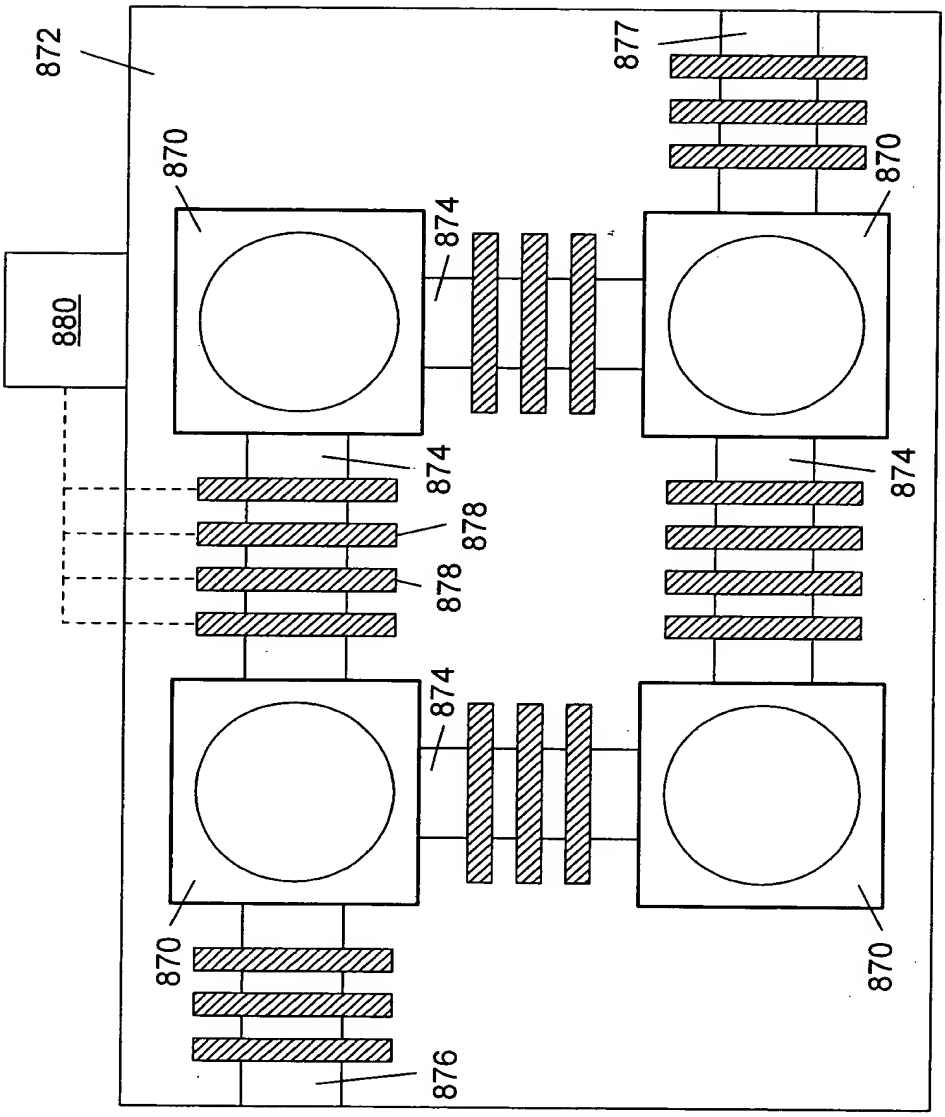


FIG. 36

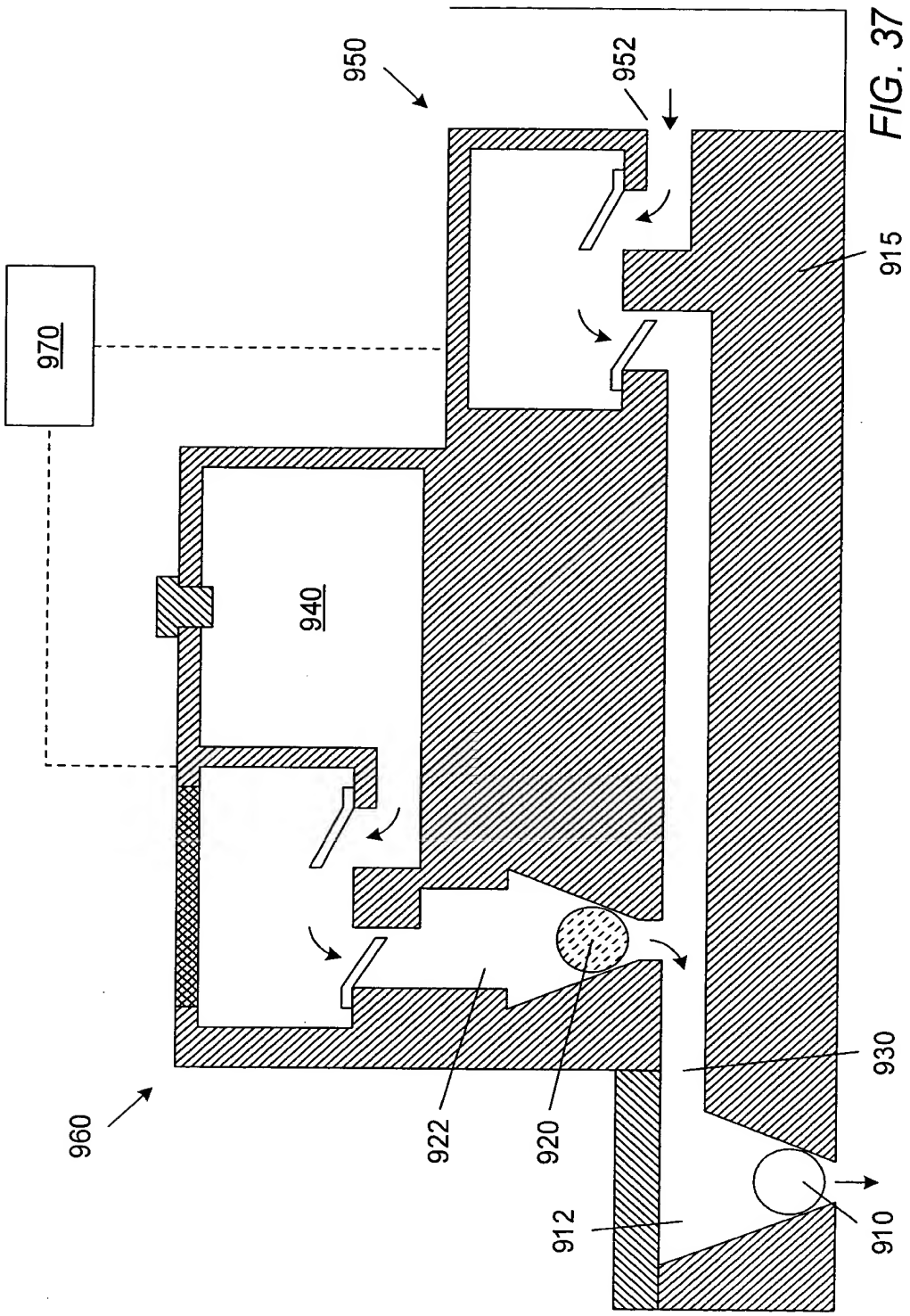


FIG. 37

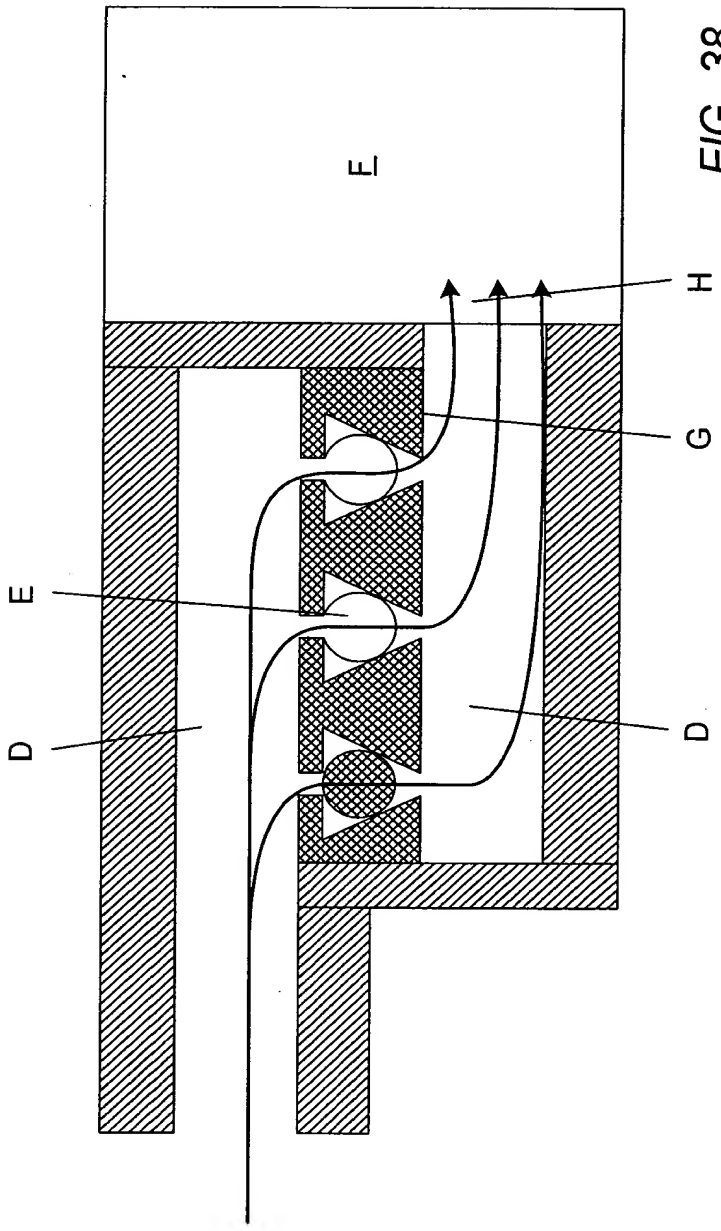


FIG. 38

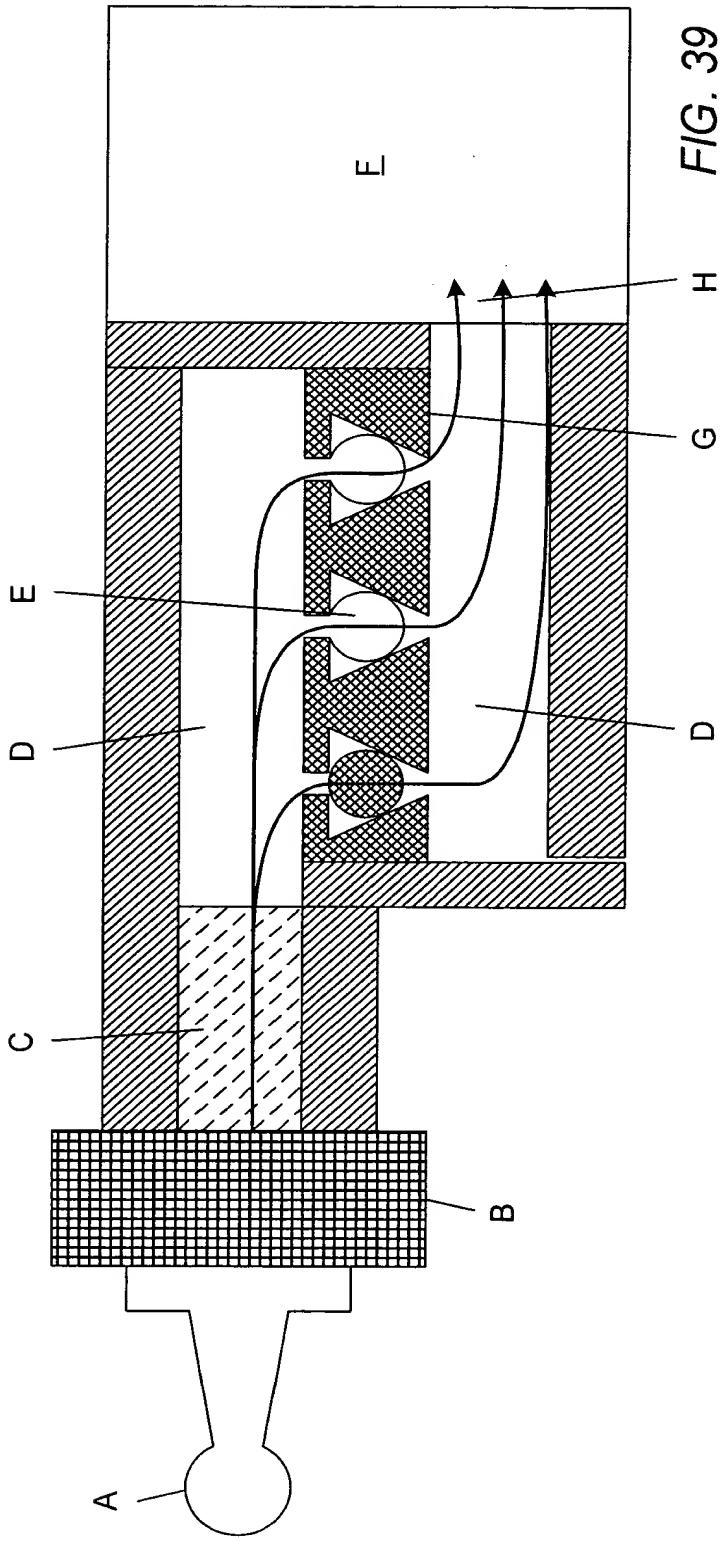


FIG. 39

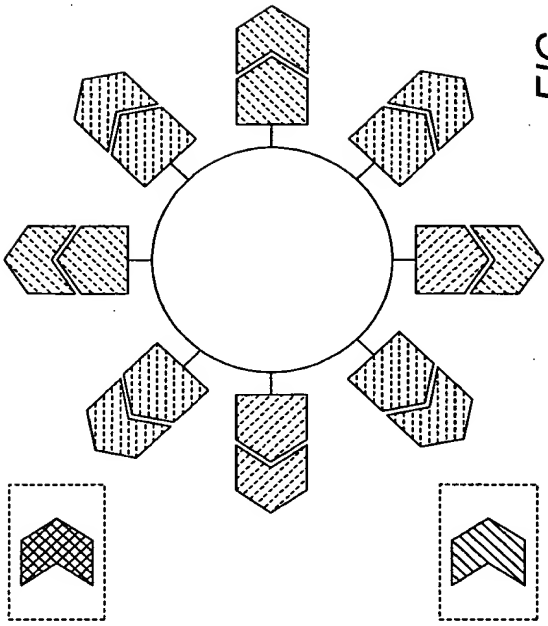


FIG. 40B

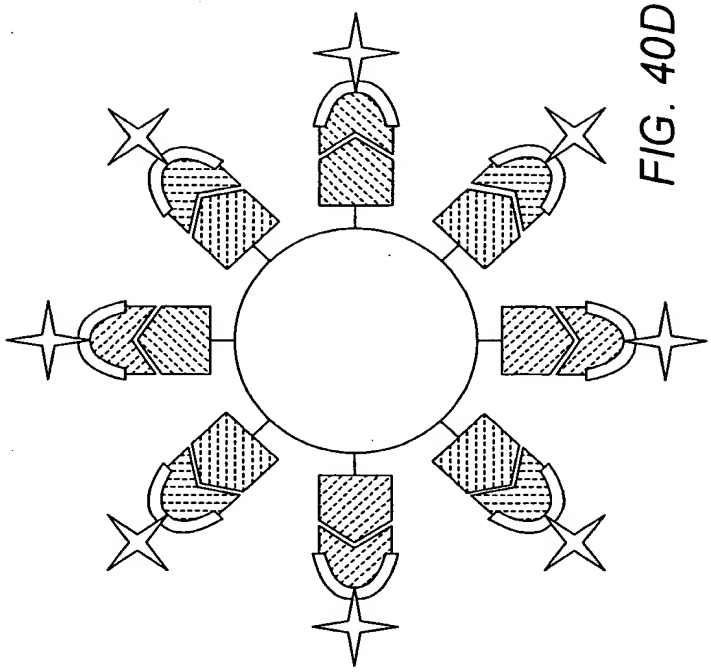


FIG. 40D

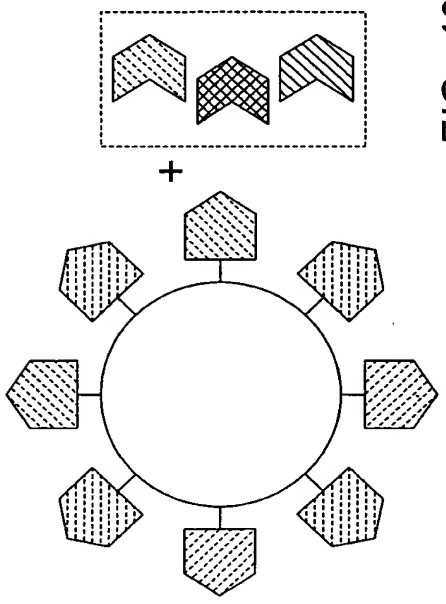


FIG. 40A

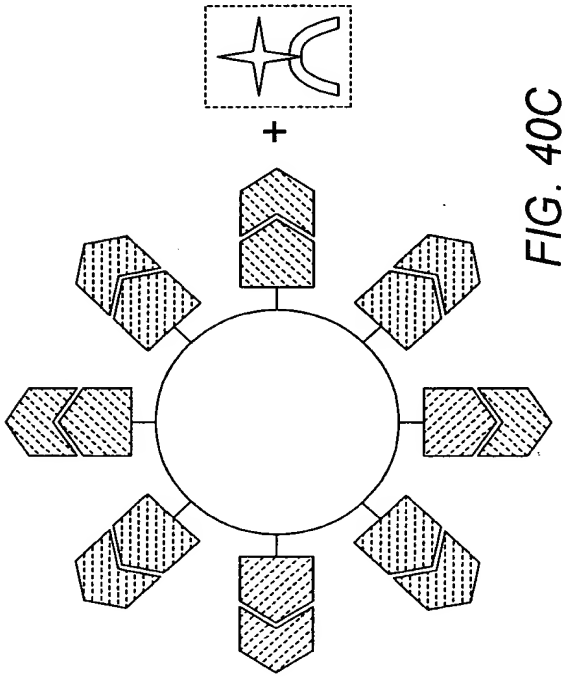


FIG. 40C

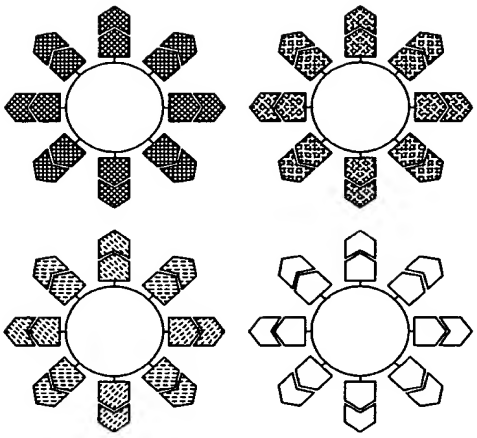


FIG. 41B

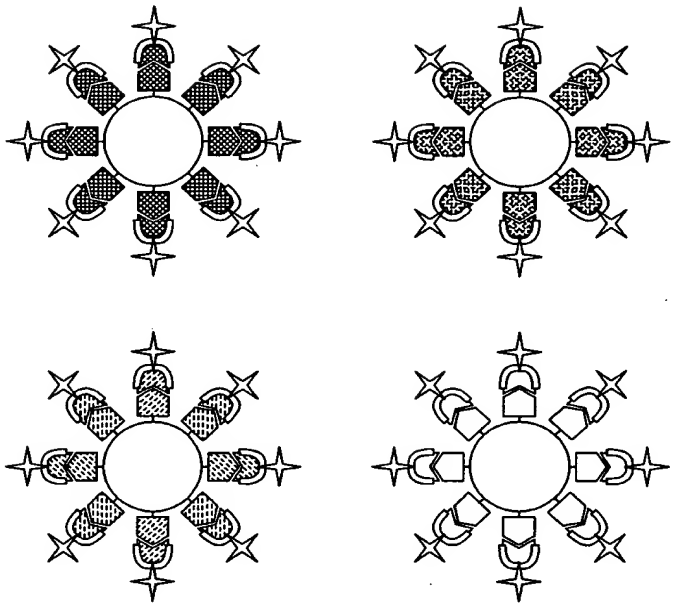


FIG. 41D

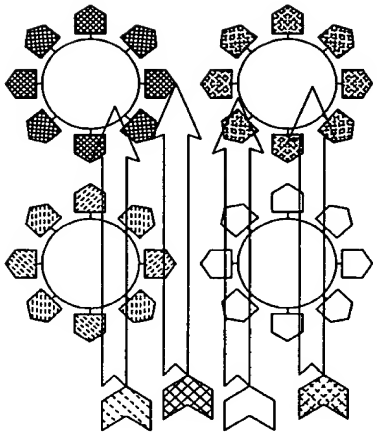


FIG. 41A

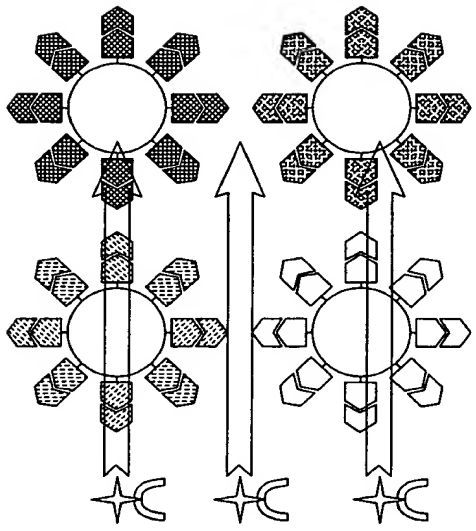


FIG. 41C

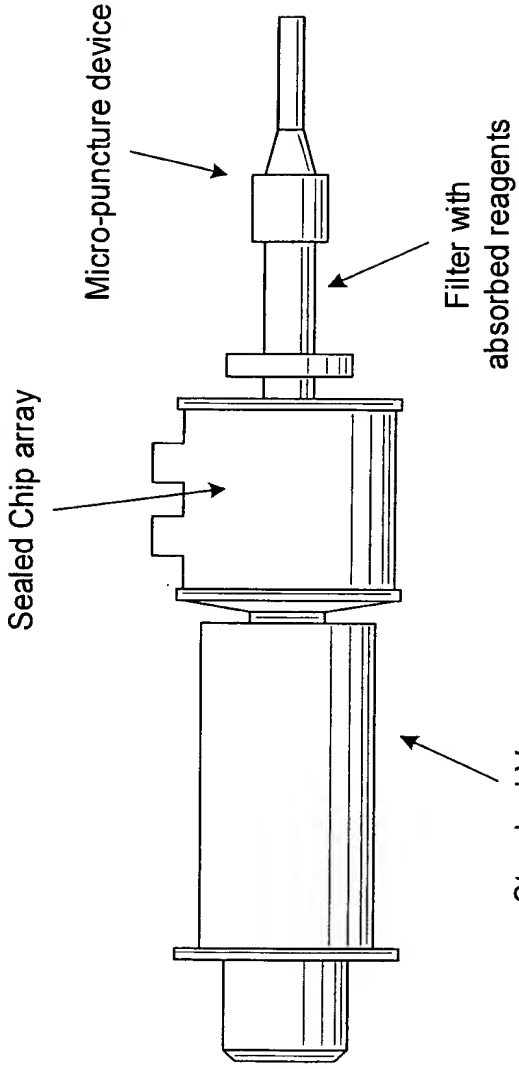

Micro-puncture device
Filter with absorbed reagents
Sealed Chip array
Standard Vacuum Source Attachment

FIG. 42

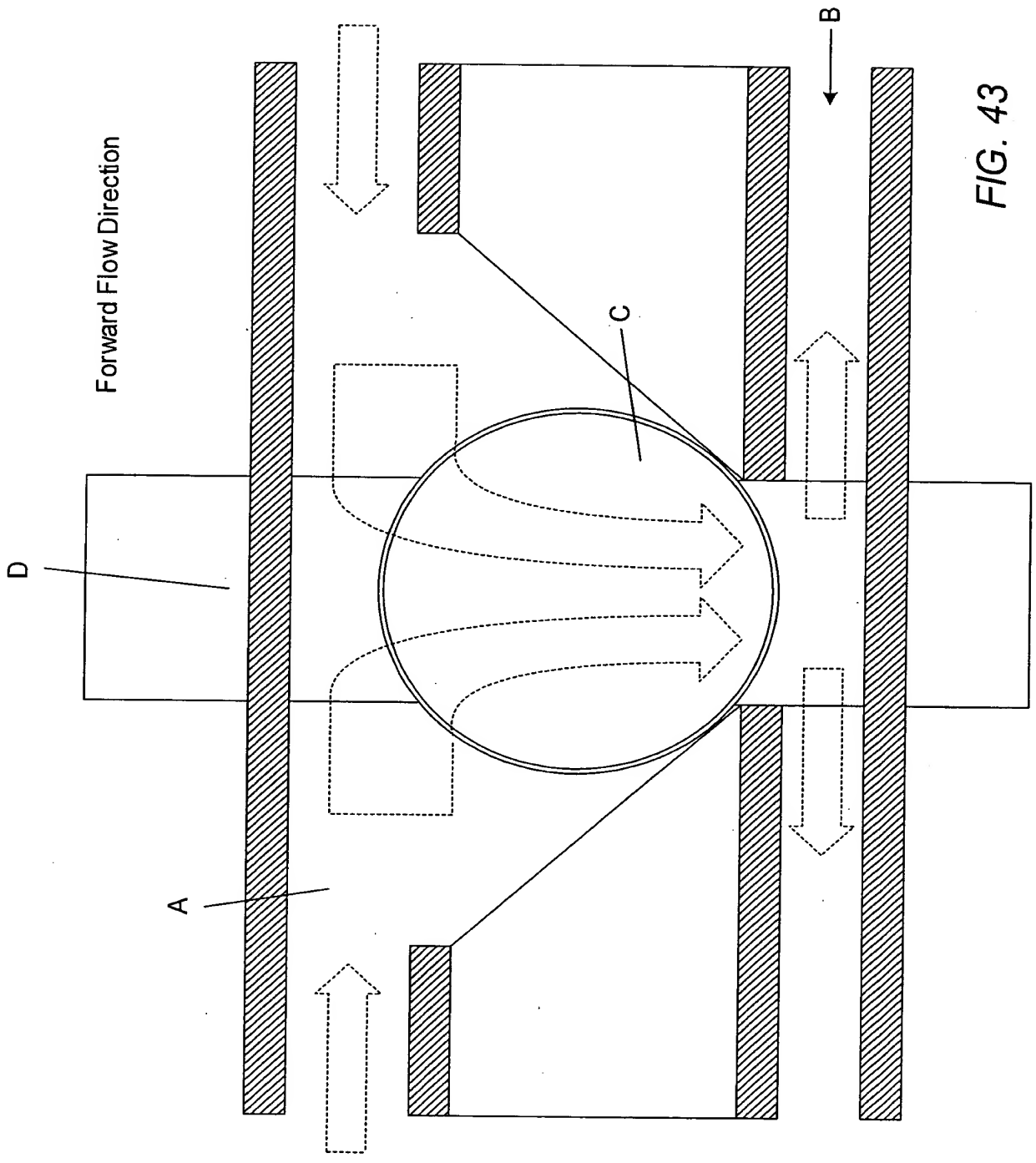


FIG. 43

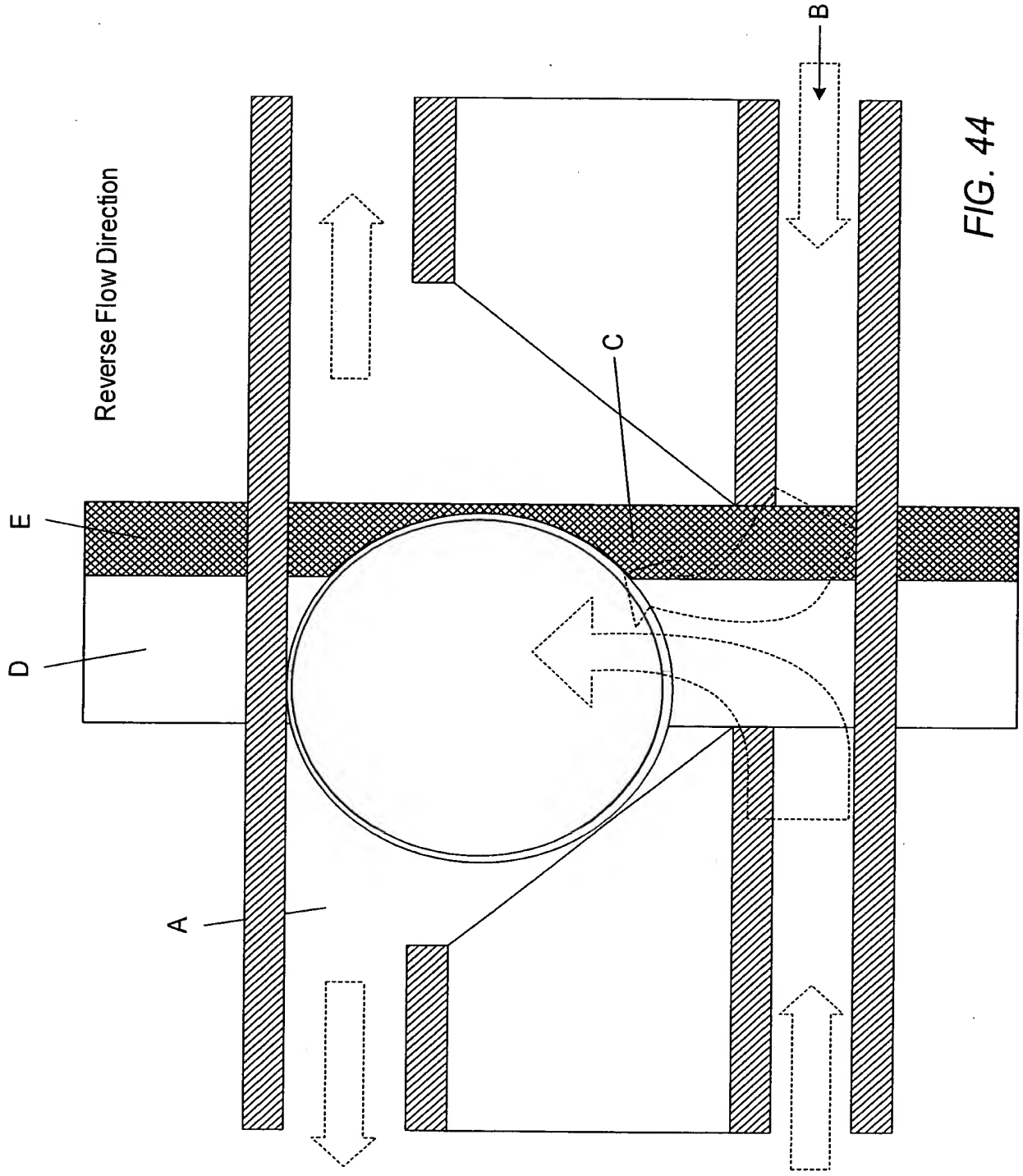


FIG. 44

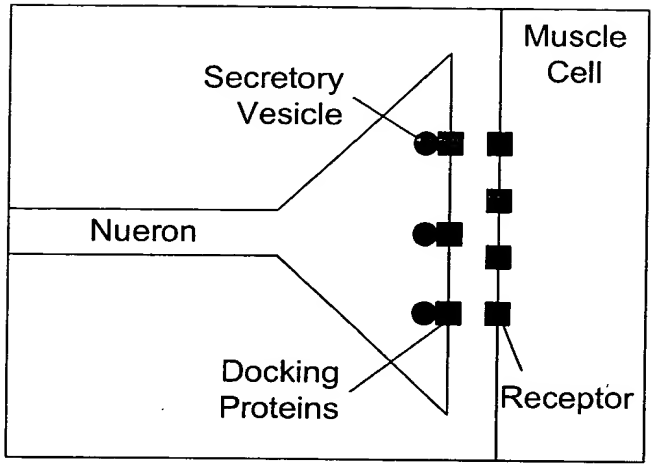


FIG. 45A

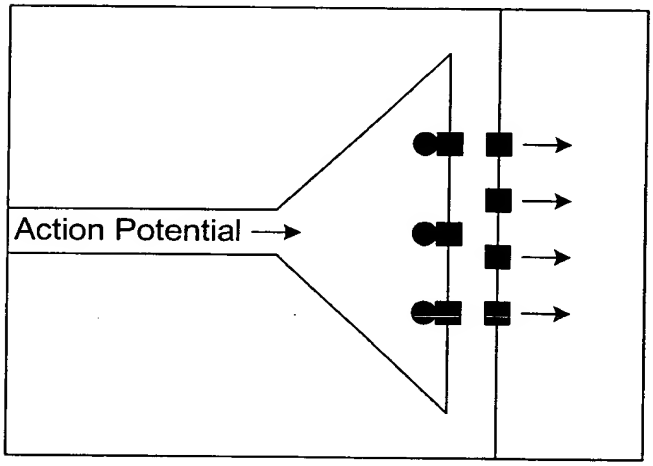


FIG. 45B

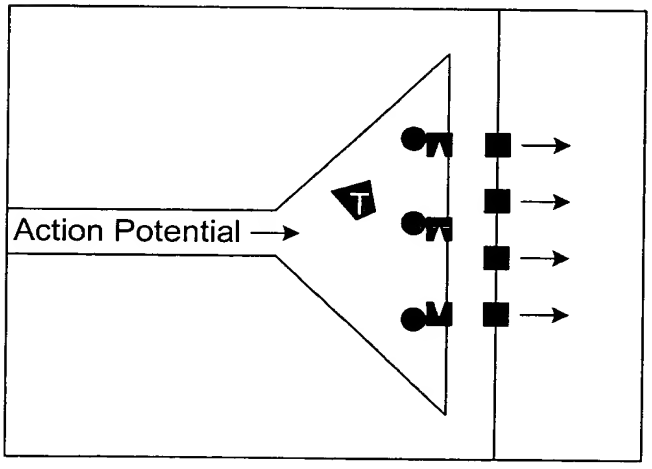


FIG. 45C

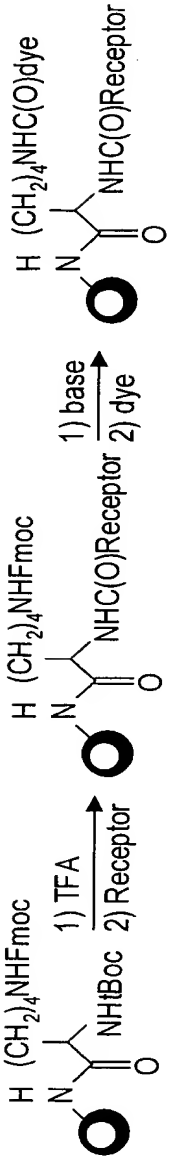


FIG. 45D

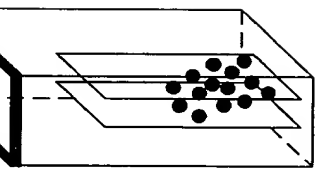


FIG. 46B

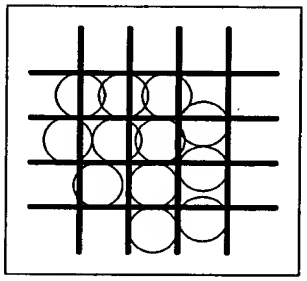


FIG. 46A

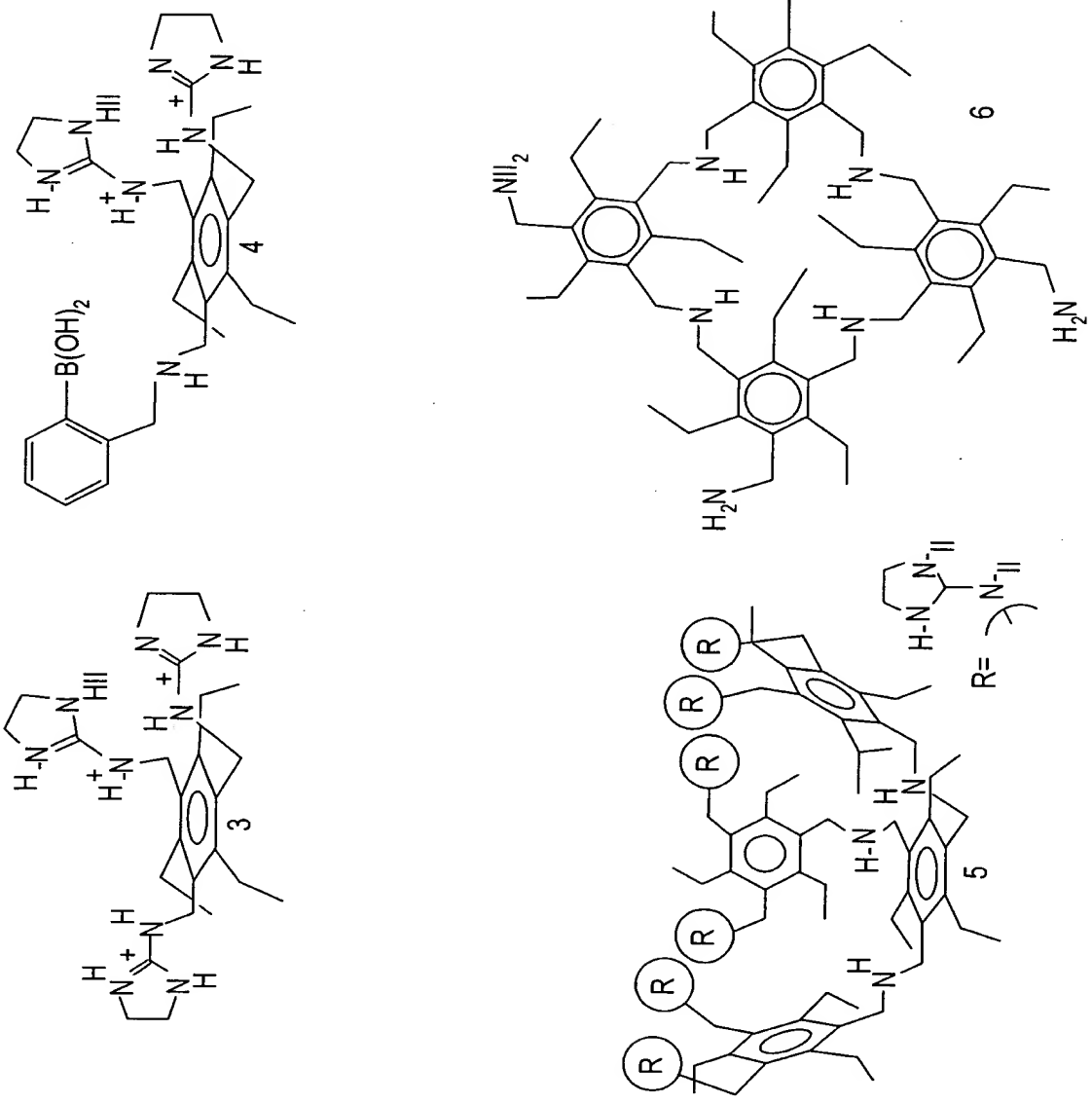
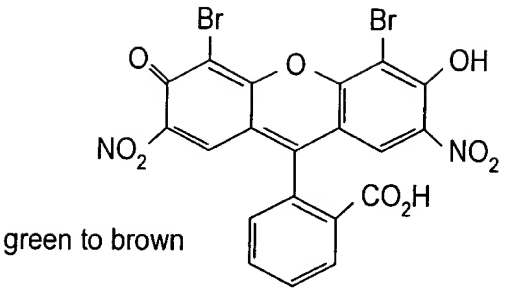
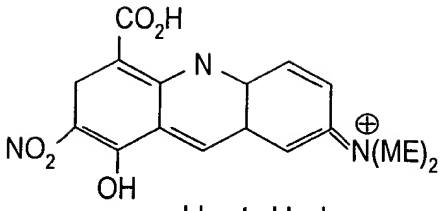


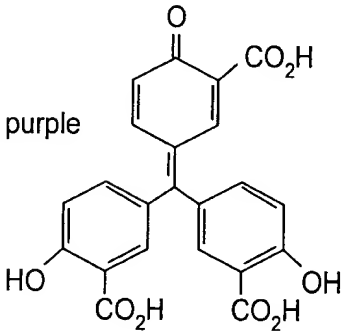
FIG. 47



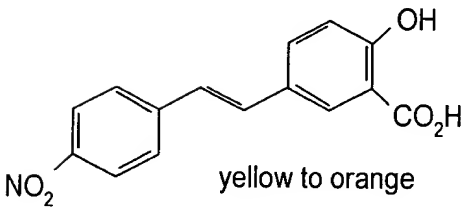
green to brown



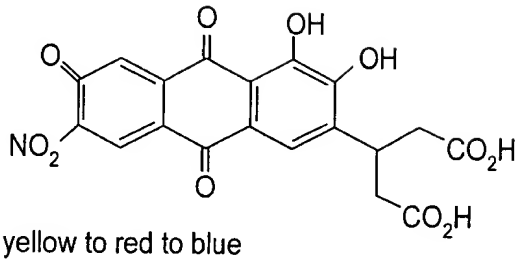
blue to black



red to purple



yellow to orange



yellow to red to blue

FIG. 48

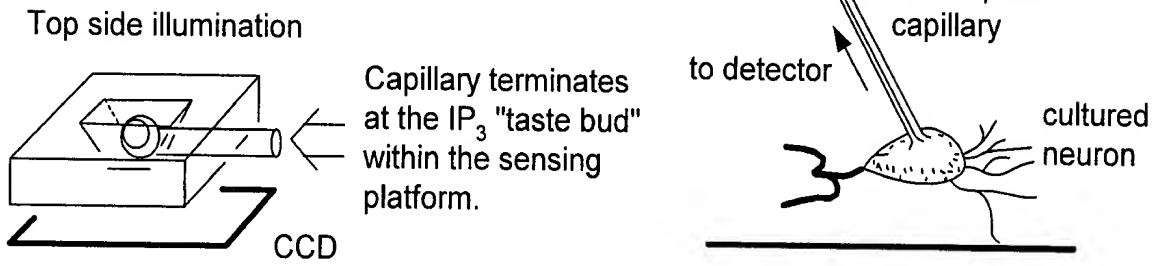

Top side illumination
Capillary terminates at the IP_3 "taste bud" within the sensing platform.
CCD
sampling/ electrophoresis capillary
to detector
cultured neuron

FIG. 49

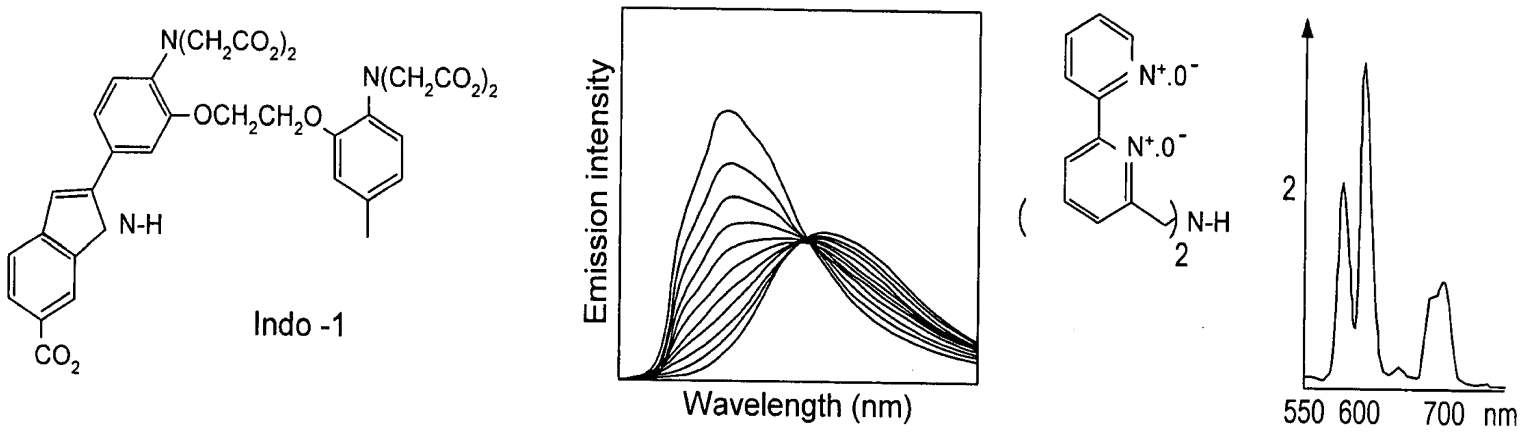

$N(CH_2CO_2)_2$
$N(CH_2CO_2)_2$
OCH_2CH_2O
N-H
CO_2
Indo -1
Emission intensity
Wavelength (nm)
$N^+.O^-$
$N^+.O^-$
N-H
2
2
550 600 700 nm

FIG. 50

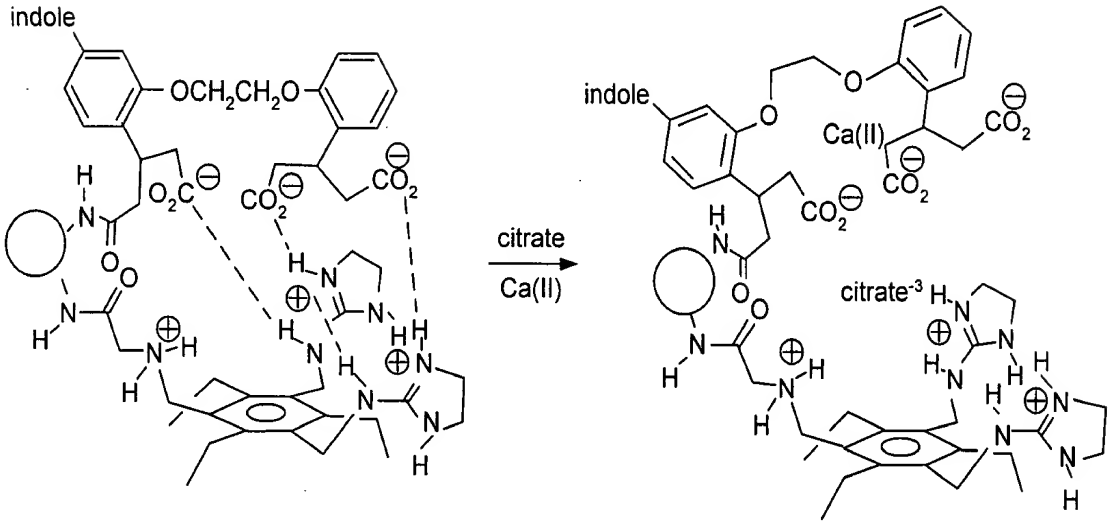

indole
citrate
Ca(II)
indole
Ca(II)
citrate-3

FIG. 51

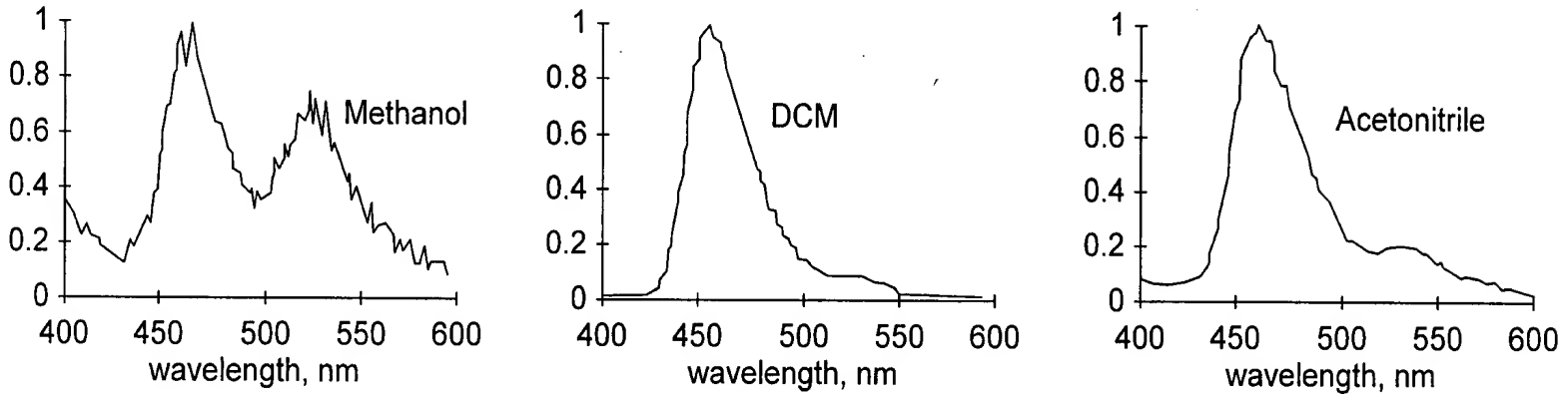

Methanol
DCM
Acetonitrile
wavelength, nm
wavelength, nm
wavelength, nm

FIG. 52

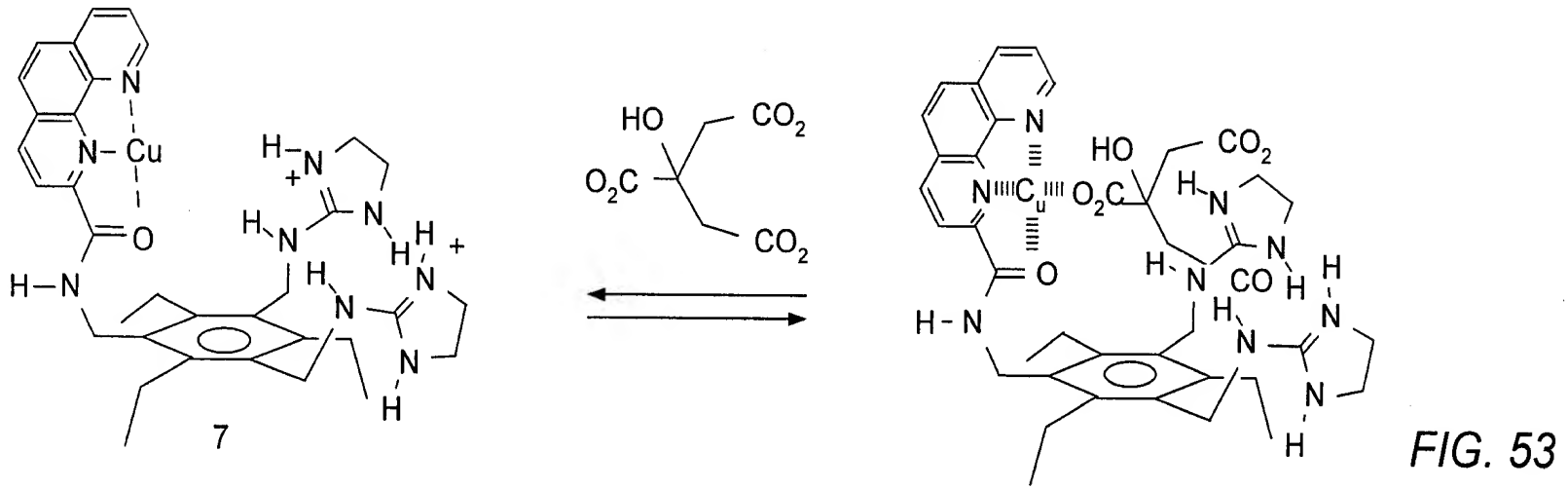

7
HO
CO2
O2C
CO2

FIG. 53

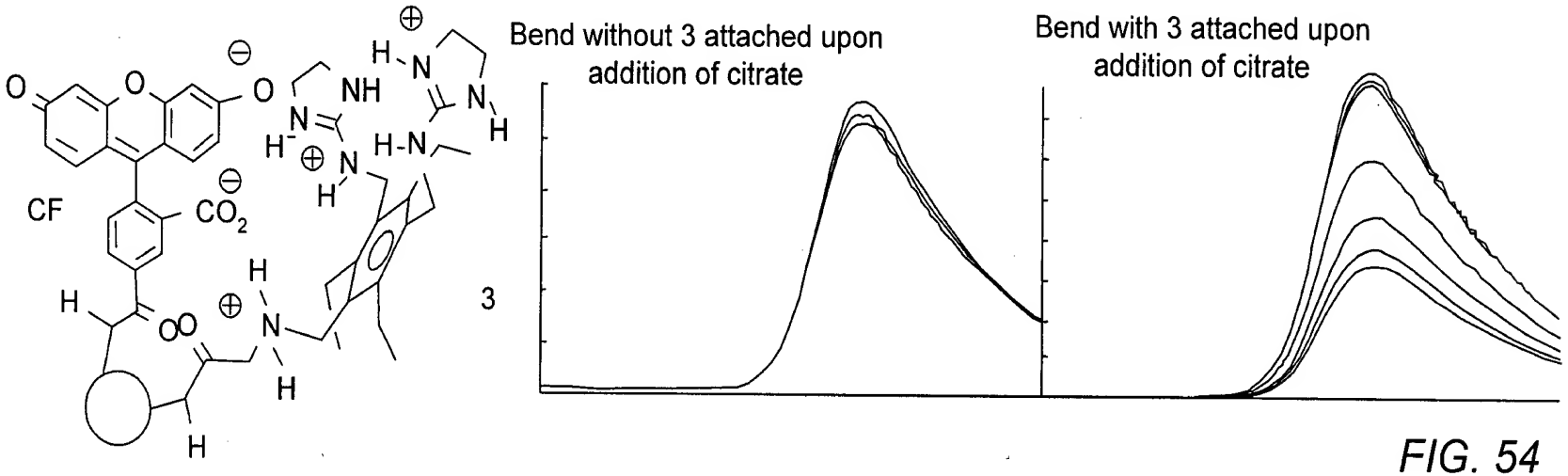

3
CF
CO2
Bend without 3 attached upon addition of citrate
Bend with 3 attached upon addition of citrate

FIG. 54

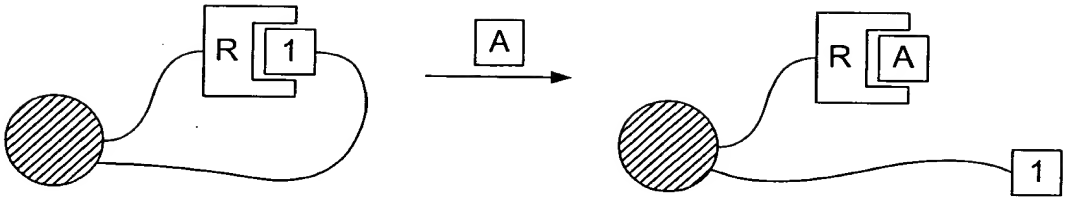


FIG. 55A

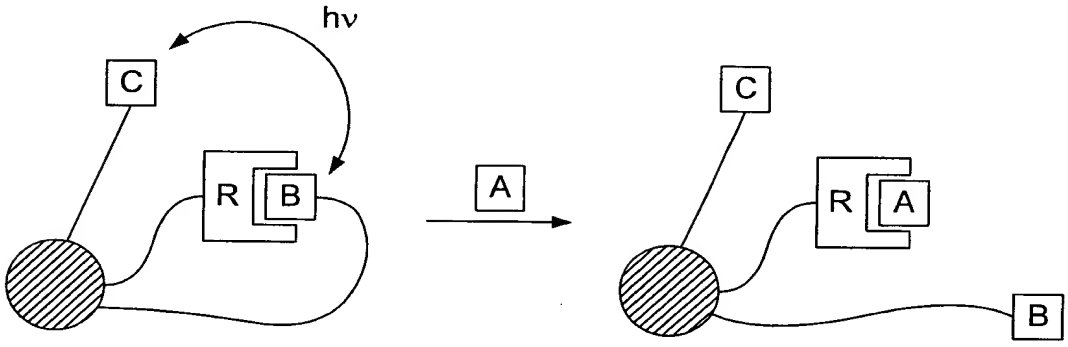


FIG. 55B

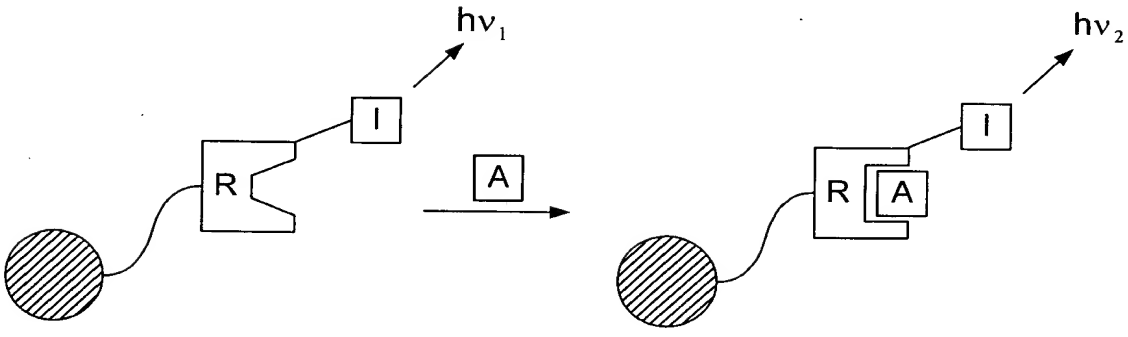


FIG. 55C

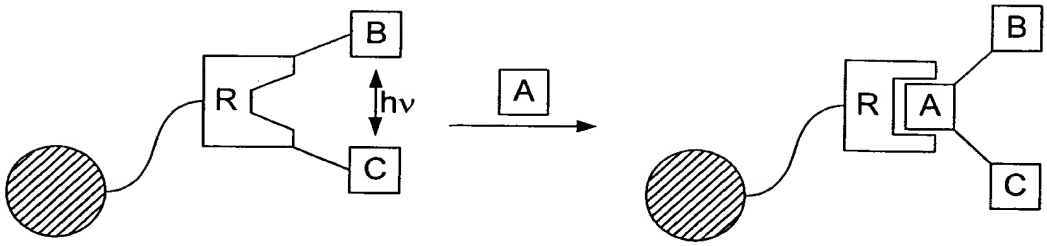


FIG. 55D

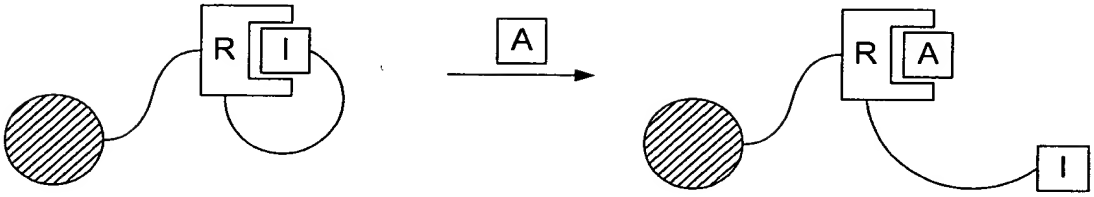


FIG. 55E

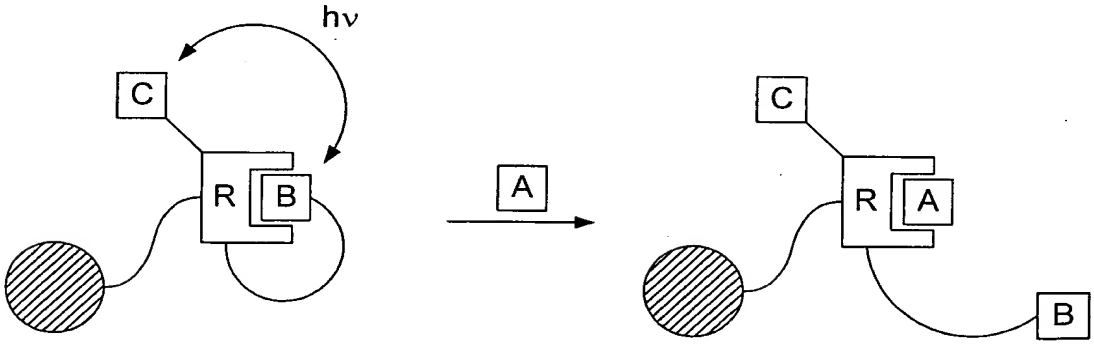


FIG. 55F

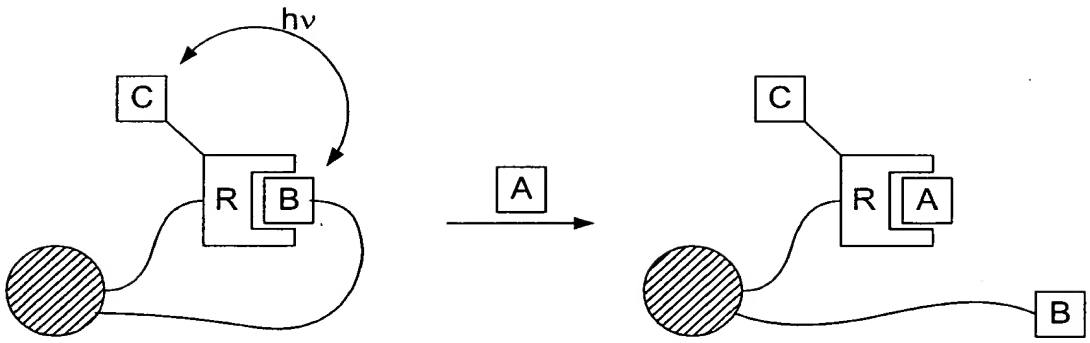


FIG. 55G

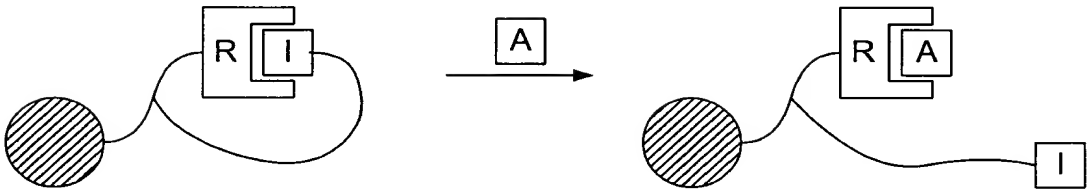


FIG. 55H

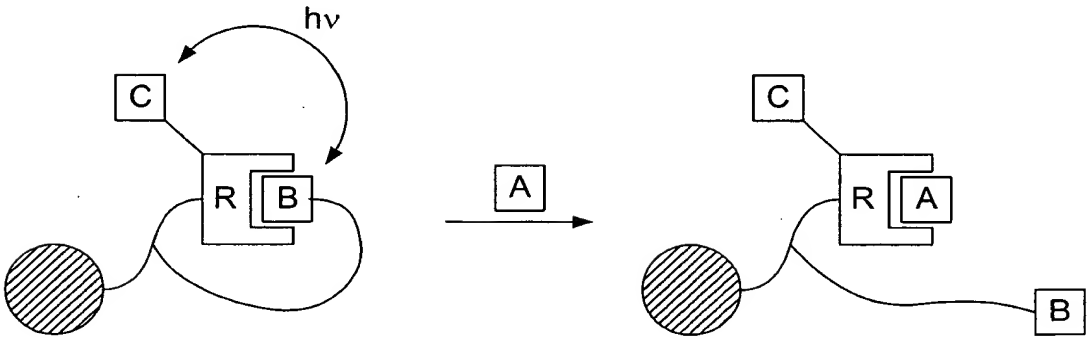


FIG. 55I

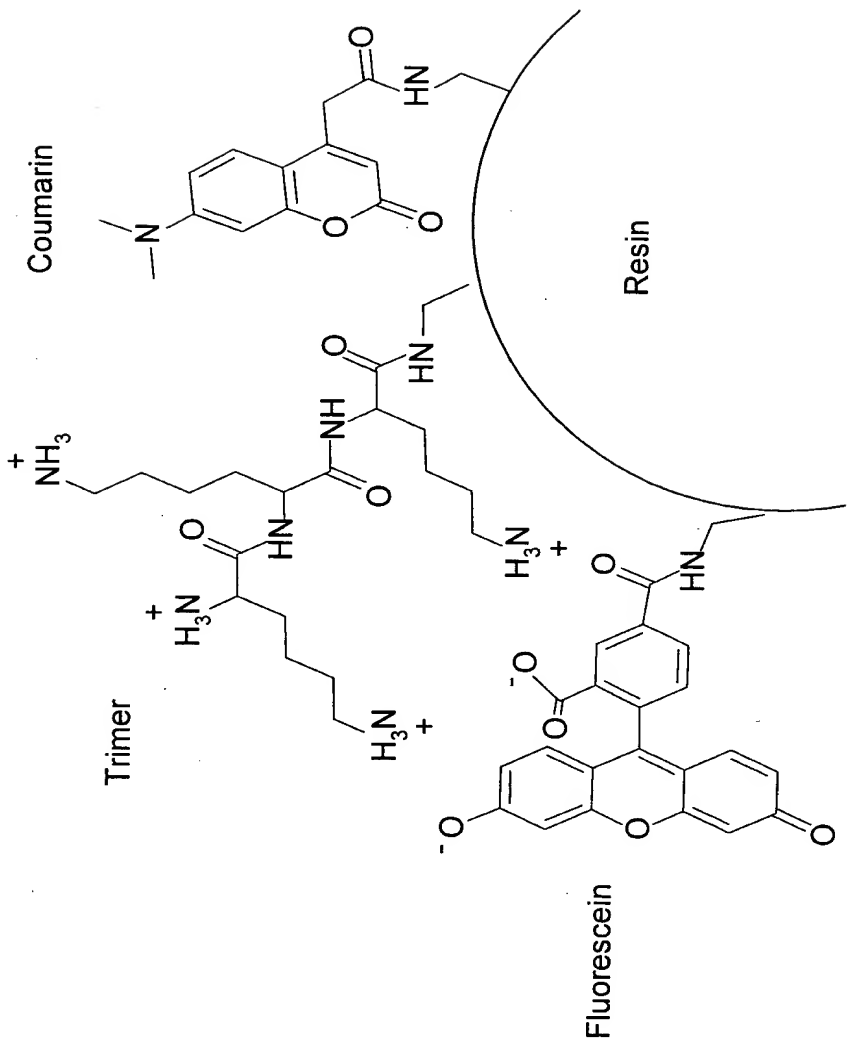


FIG. 56

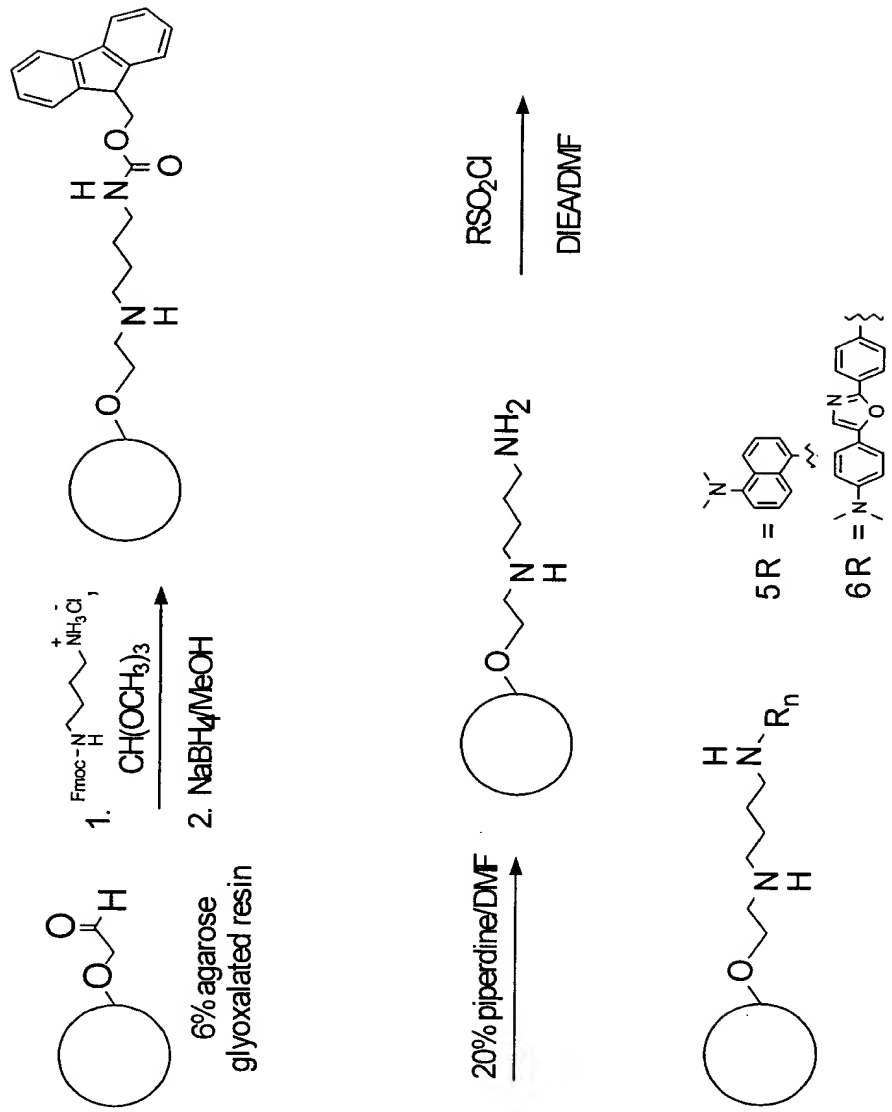

6% agarose
glyoxalated resin
1.
2. NaBH4/MeOH
CH(OCH3)3
20% piperdine/DMF
RSO2Cl
DIEA/DMF
5R =
6R =

FIG. 57

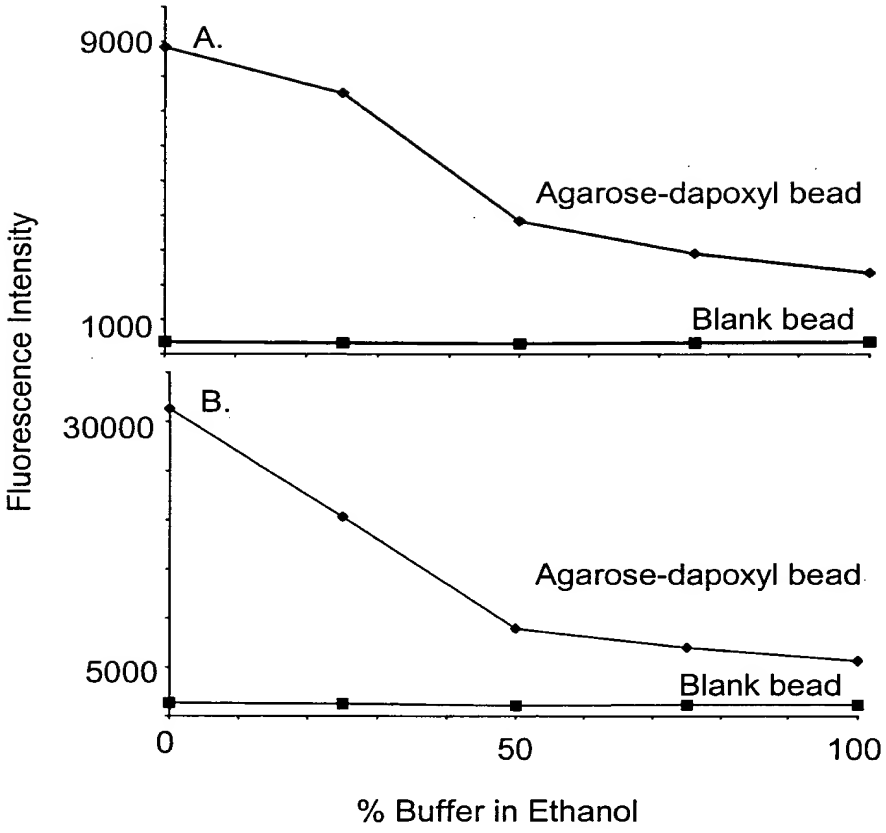

9000
A.
Agarose-dapoxyl bead
1000
Blank bead
Fluorescence Intensity
30000
B.
Agarose-dapoxyl bead
5000
Blank bead
0
50
100
% Buffer in Ethanol

FIG. 58

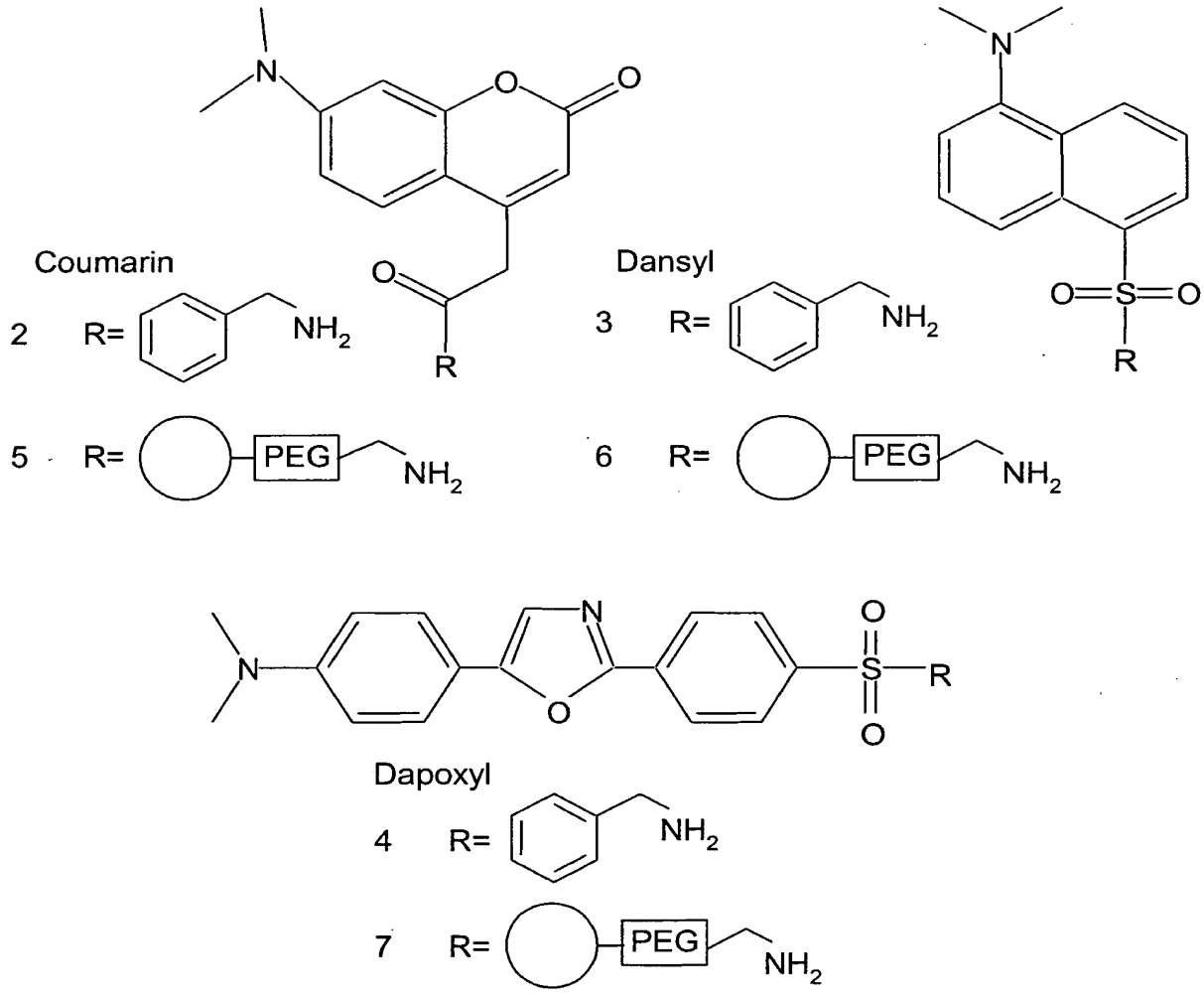
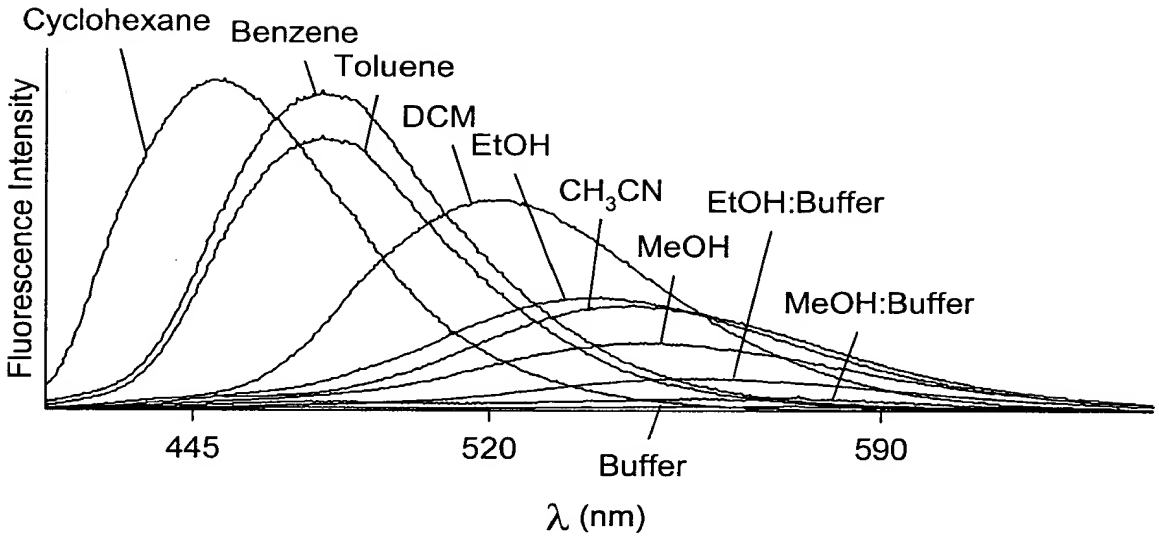

Coumarin
2 R=
NH2
5 R=
PEG
NH2
Dansyl
3 R=
NH2
6 R=
PEG
NH2
Dapoxyl
4 R=
NH2
7 R=
PEG
NH2

FIG. 59


Cyclohexane
Benzene
Toluene
DCM
EtOH
CH3CN
EtOH:Buffer
MeOH
MeOH:Buffer
Fluorescence Intensity
445
520
Buffer
590
λ (nm)

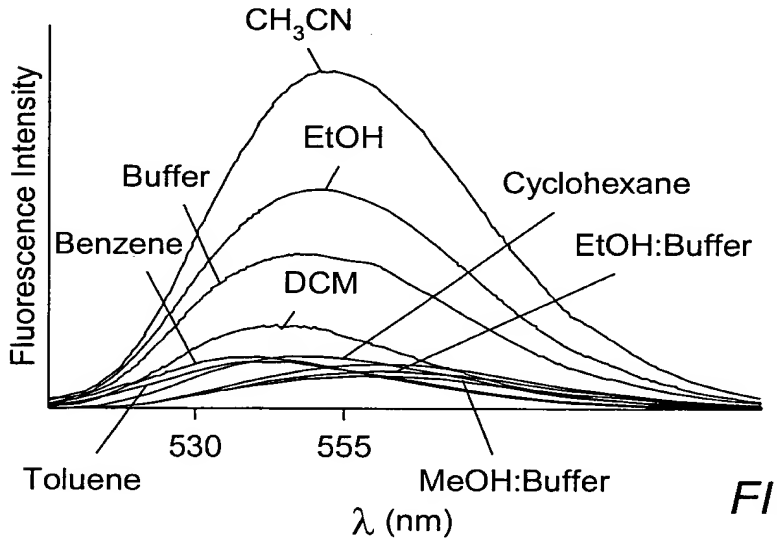
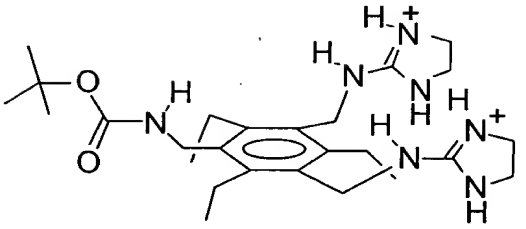
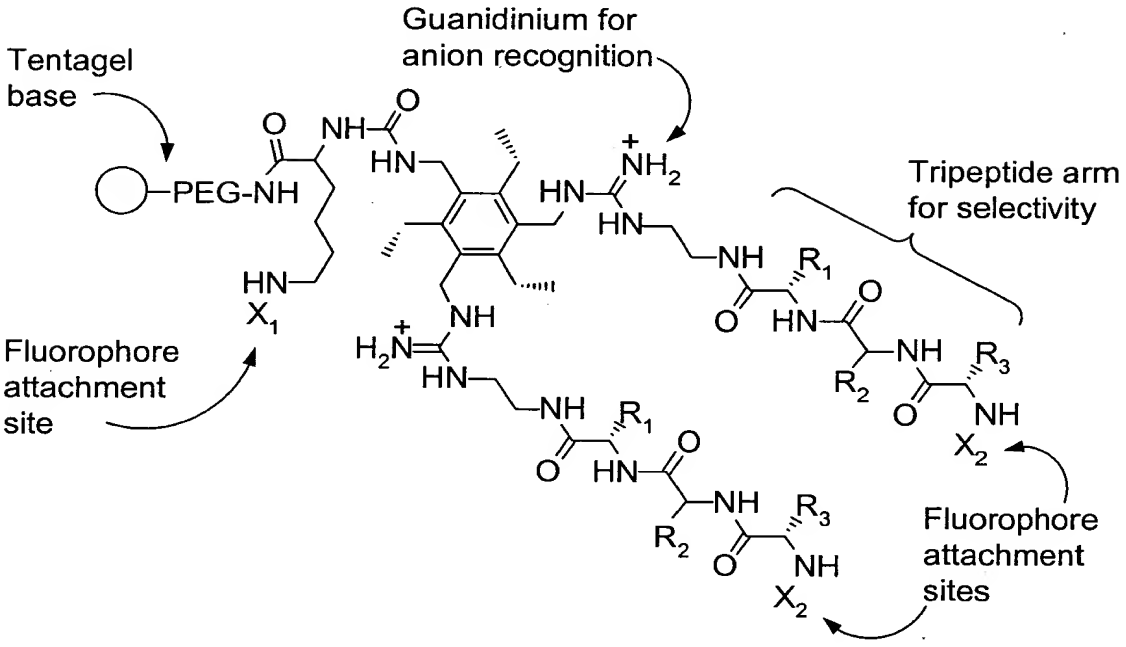

CH3CN
EtOH
Buffer
Cyclohexane
Benzene
EtOH:Buffer
DCM
Fluorescence Intensity
530
555
Toluene
MeOH:Buffer
λ (nm)

FIG. 60



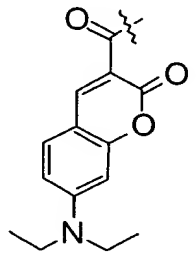
1



2: $X_1=X_2=H$

3: $X_1=$

$X_2=$



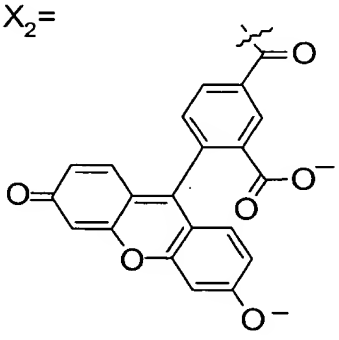


FIG. 61

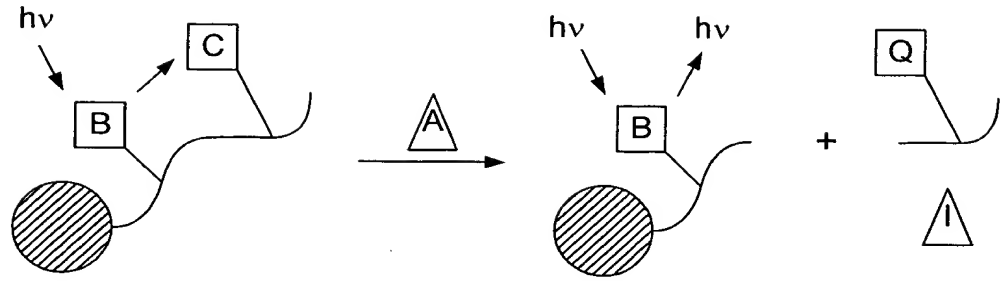


FIG. 62A

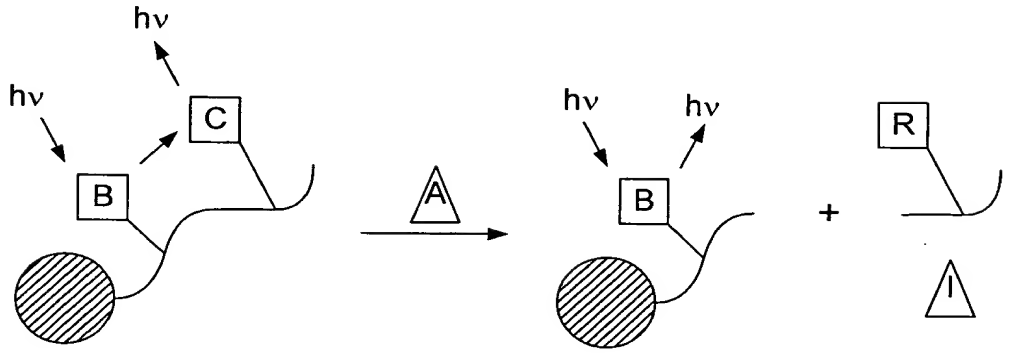


FIG. 62B

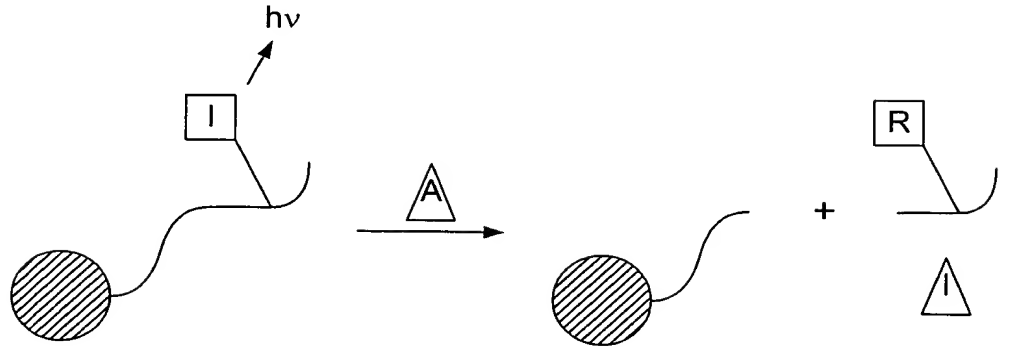


FIG. 62C

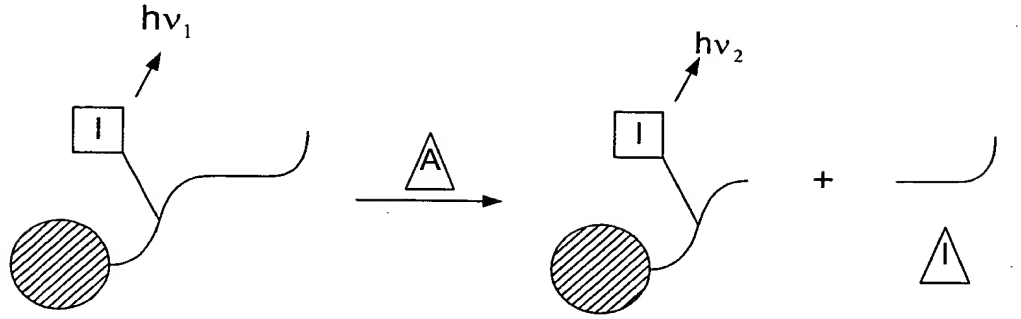


FIG. 62D

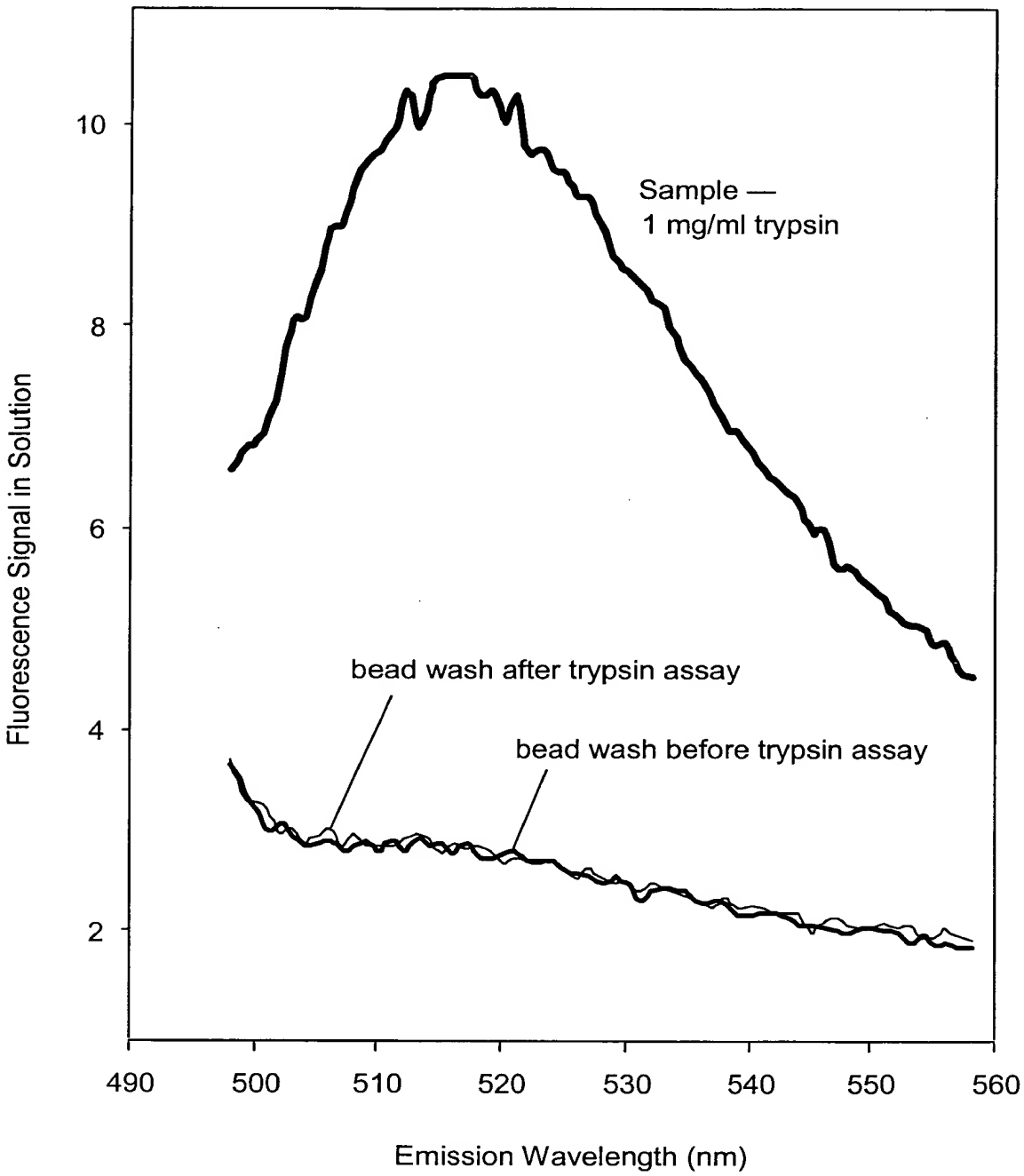

Fluorescence Signal in Solution
10
8
6
4
2
Sample —
1 mg/ml trypsin
bead wash after trypsin assay
bead wash before trypsin assay
490
500
510
520
530
540
550
560
Emission Wavelength (nm)

FIG. 63

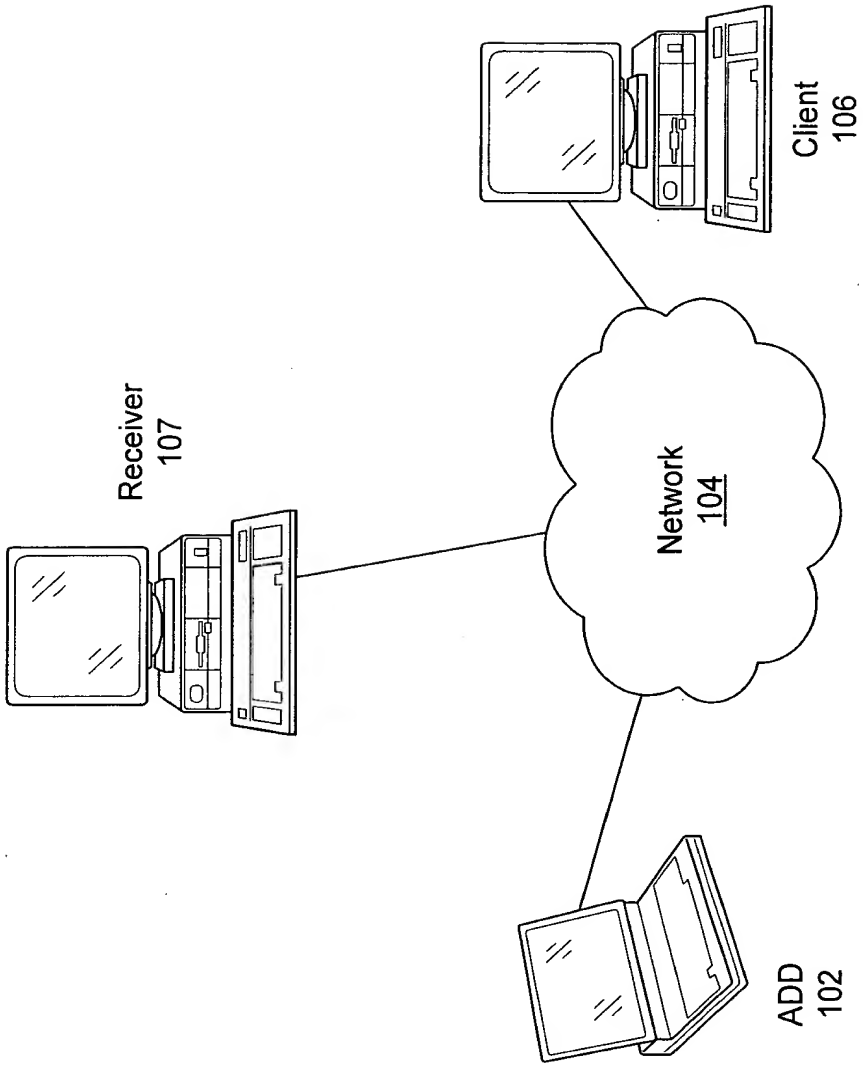


FIG. 64

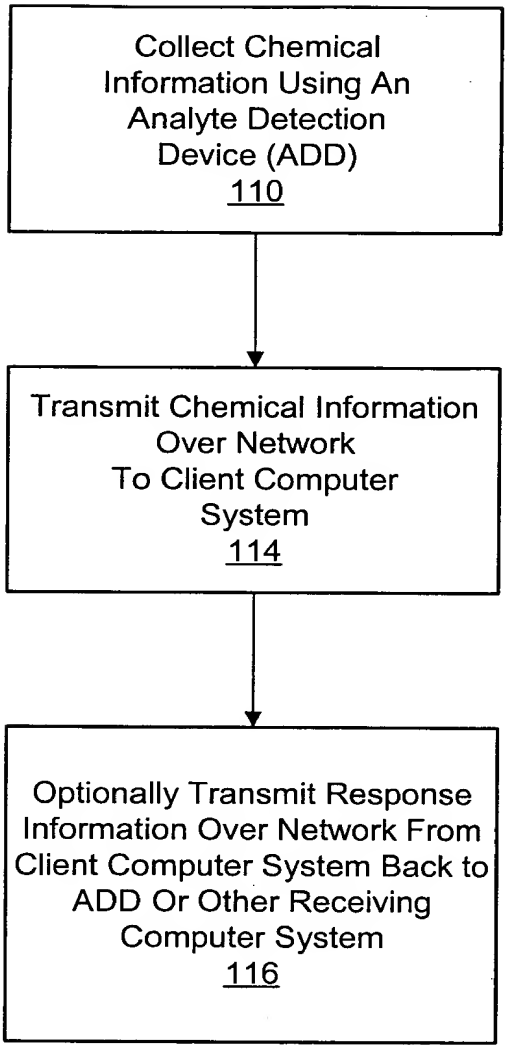

Collect Chemical Information Using An Analyte Detection Device (ADD)
110
Transmit Chemical Information Over Network To Client Computer System
114
Optionally Transmit Response Information Over Network From Client Computer System Back to ADD Or Other Receiving Computer System
116

FIG. 65

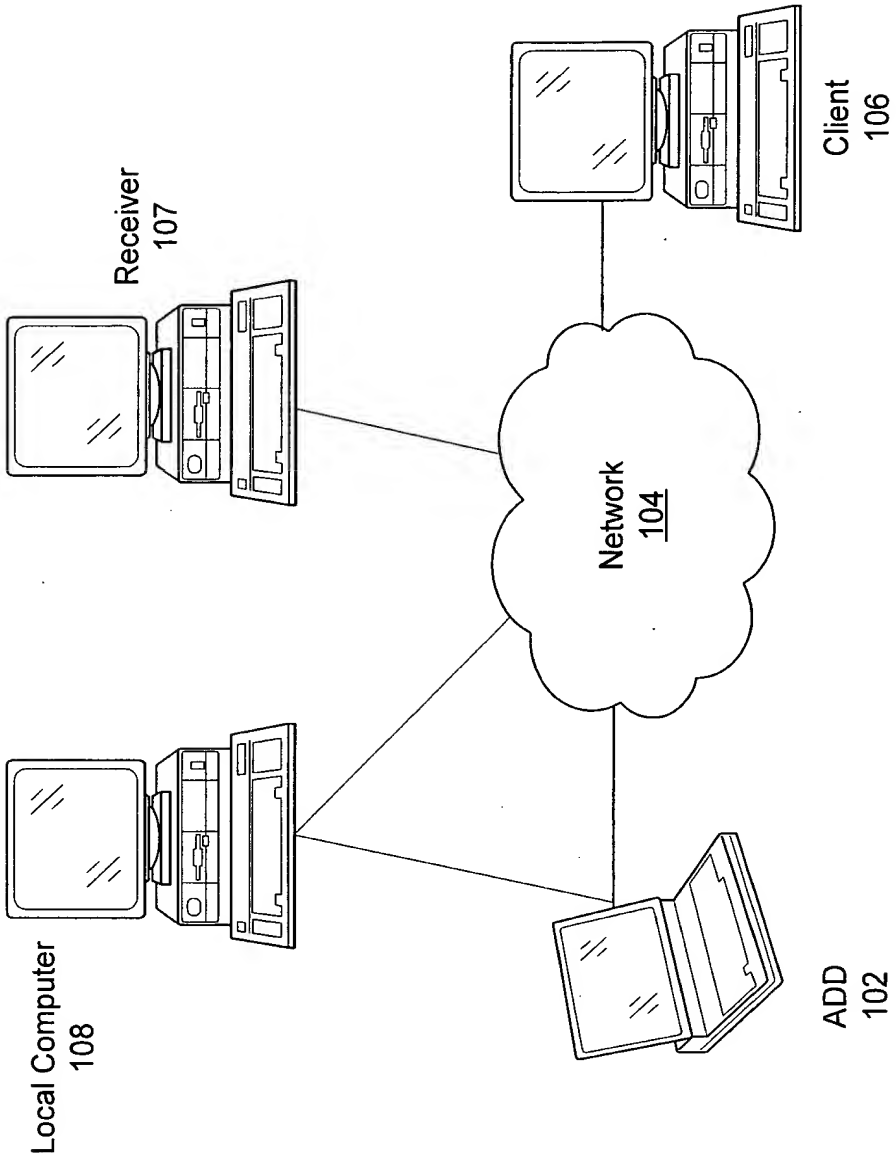

Client
106
Receiver
107
Network
104
Local Computer
108
ADD
102

FIG. 66

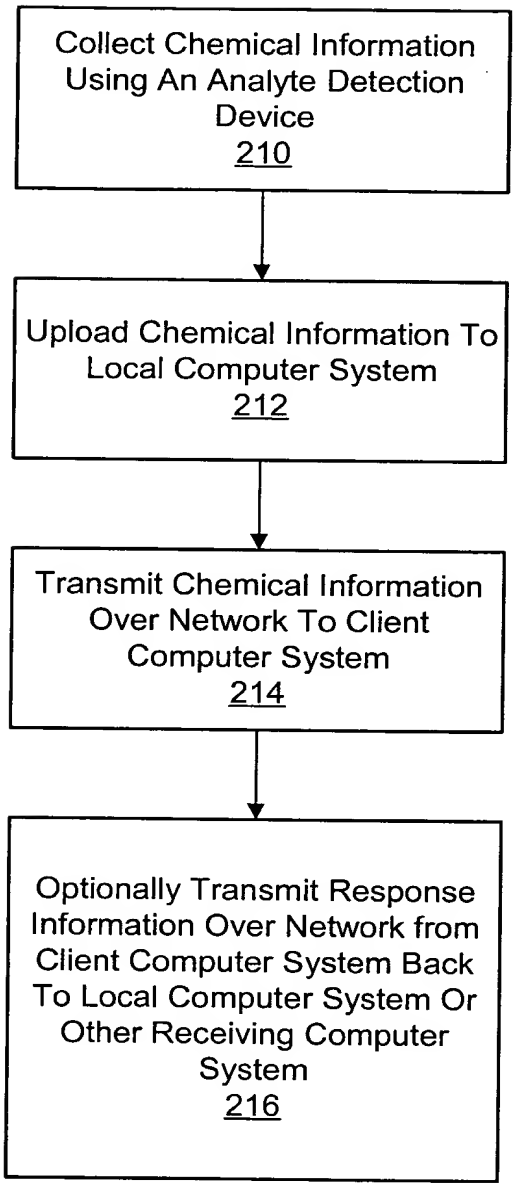

Collect Chemical Information Using An Analyte Detection Device
210
Upload Chemical Information To Local Computer System
212
Transmit Chemical Information Over Network To Client Computer System
214
Optionally Transmit Response Information Over Network from Client Computer System Back To Local Computer System Or Other Receiving Computer System
216

FIG. 67

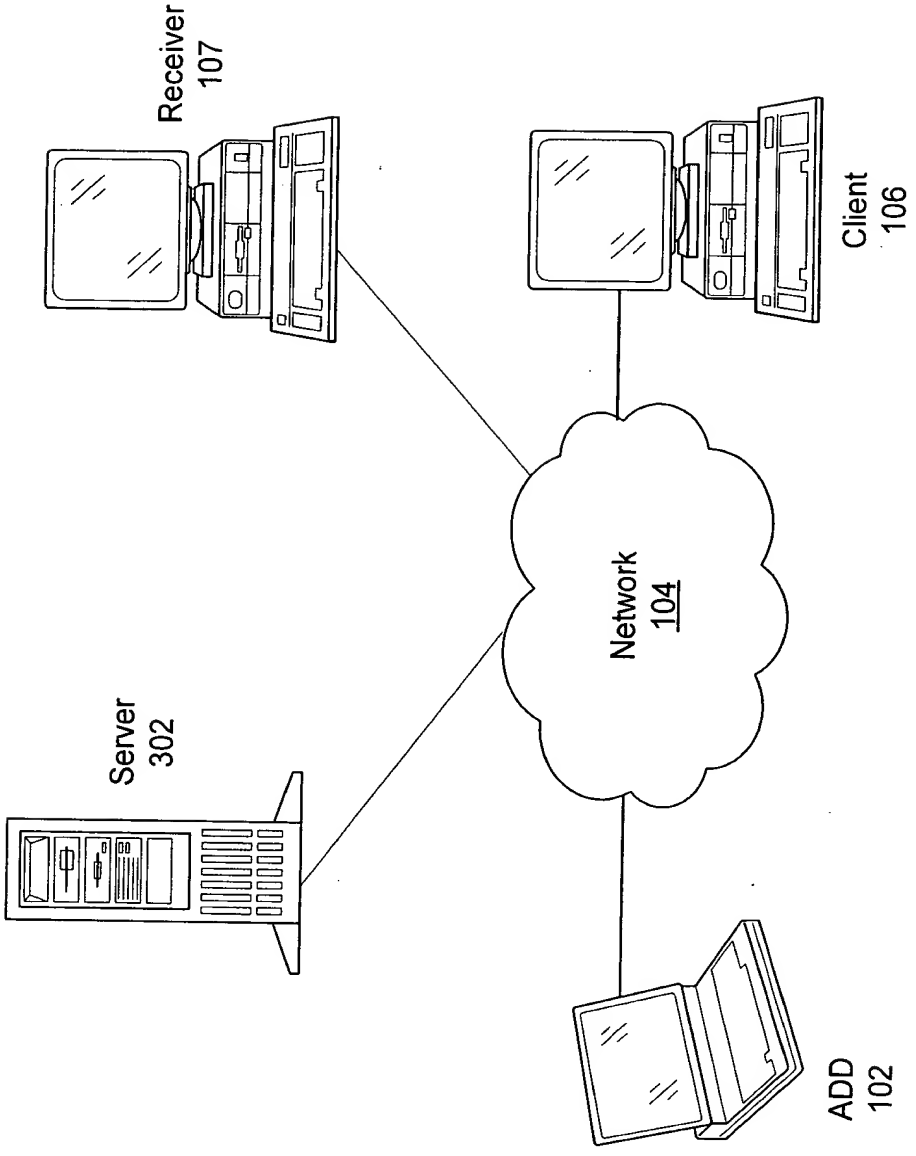


FIG. 68

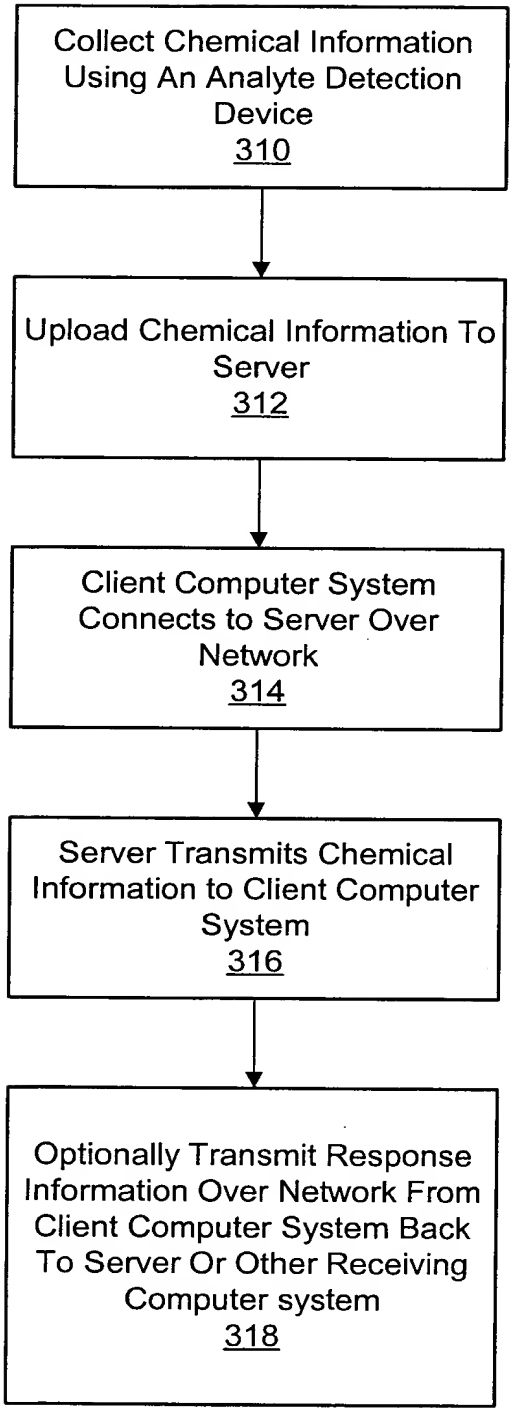

Collect Chemical Information Using An Analyte Detection Device
310
Upload Chemical Information To Server
312
Client Computer System Connects to Server Over Network
314
Server Transmits Chemical Information to Client Computer System
316
Optionally Transmit Response Information Over Network From Client Computer System Back To Server Or Other Receiving Computer system
318

FIG. 69

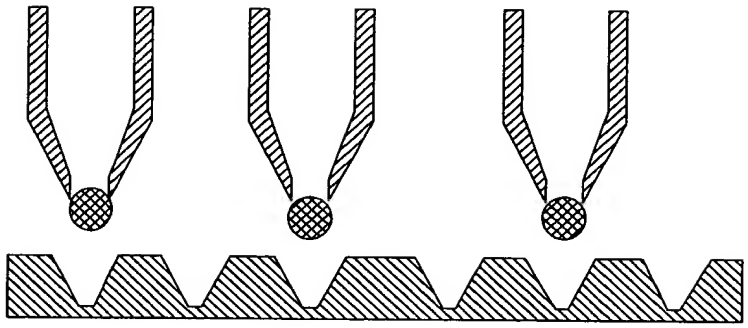


FIG. 70A

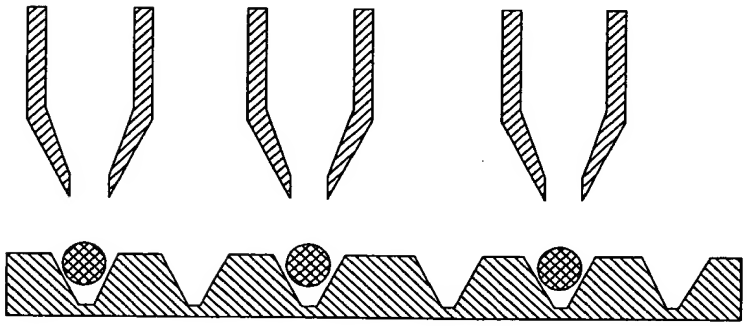


FIG. 70B

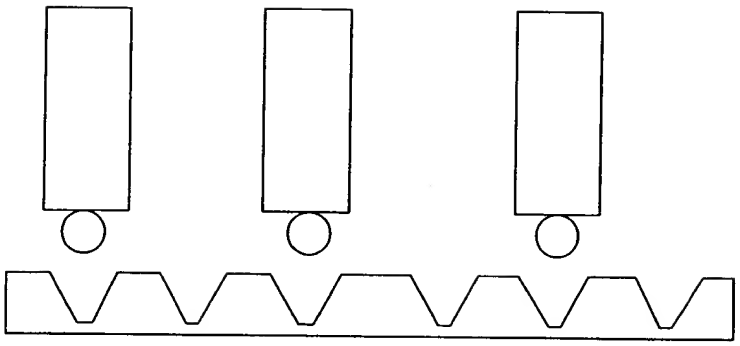


FIG. 71A

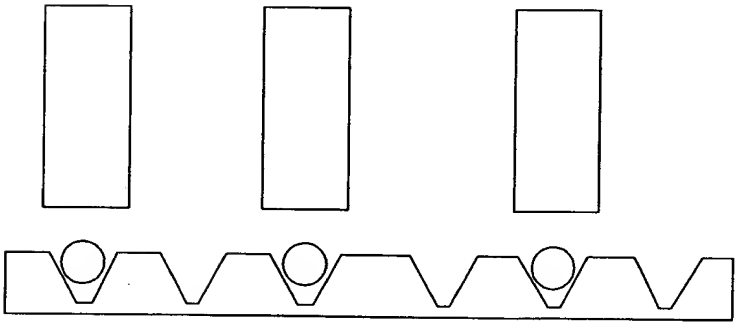


FIG. 71B

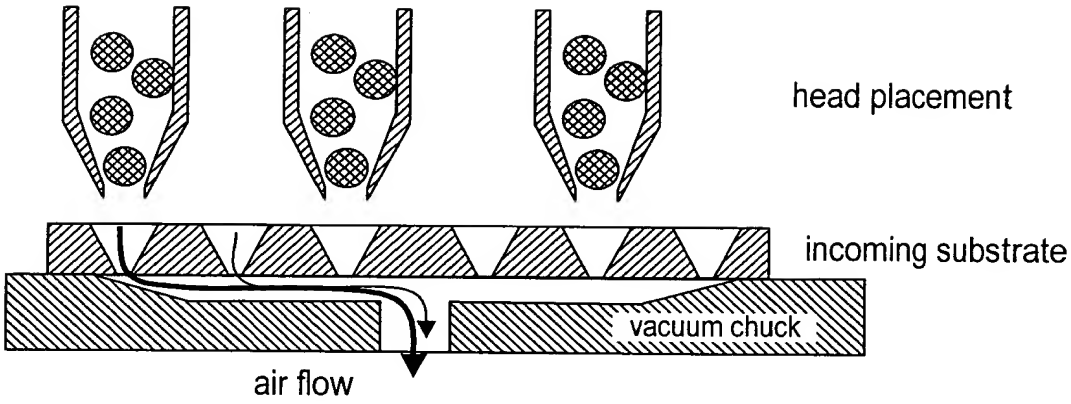


FIG. 72A

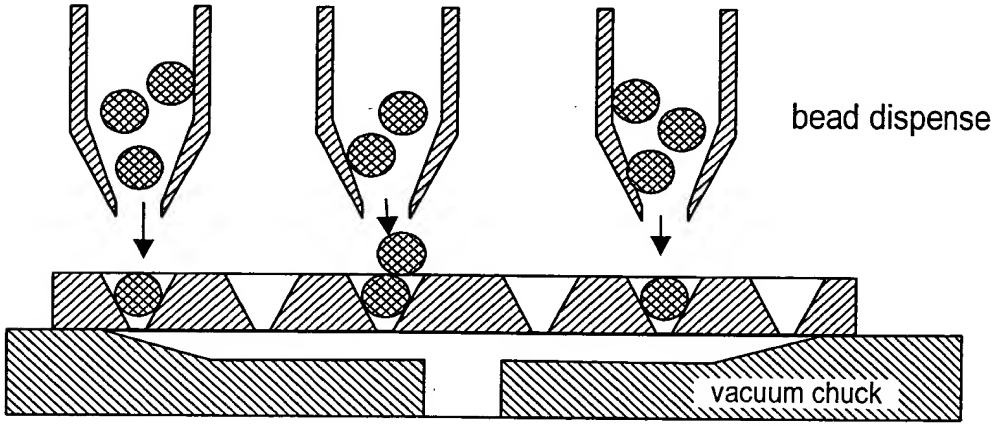


FIG. 72B

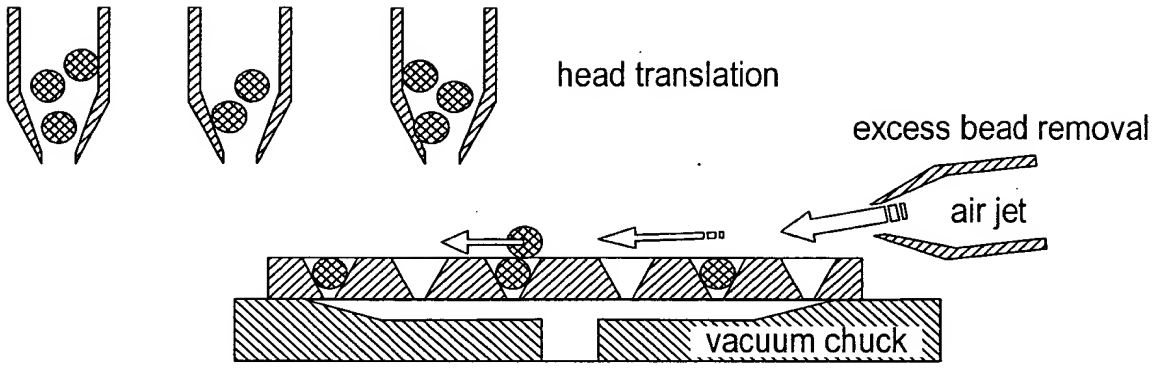


FIG. 72C

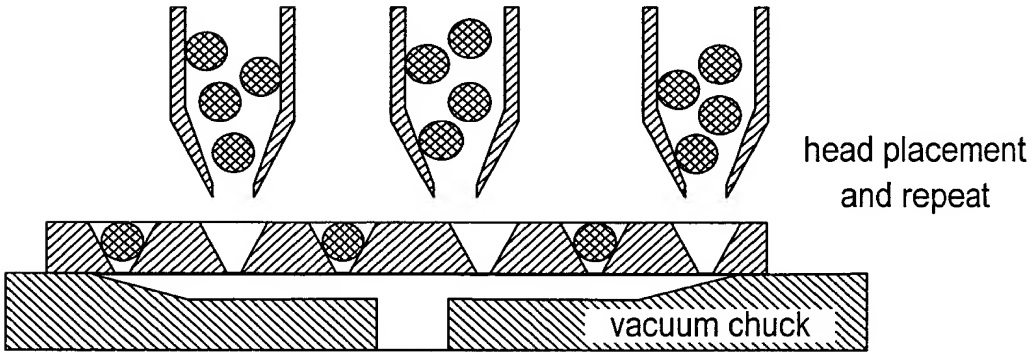


FIG. 72D

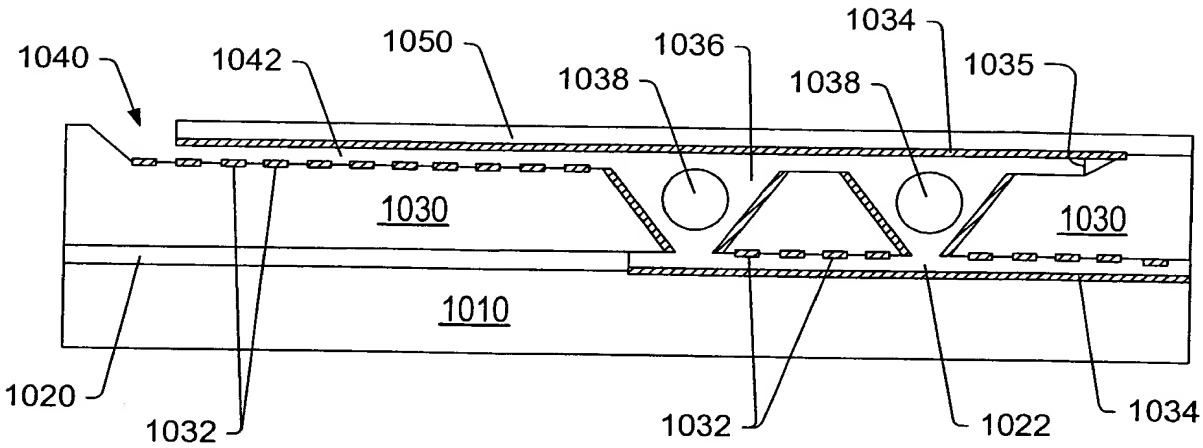


FIG. 73

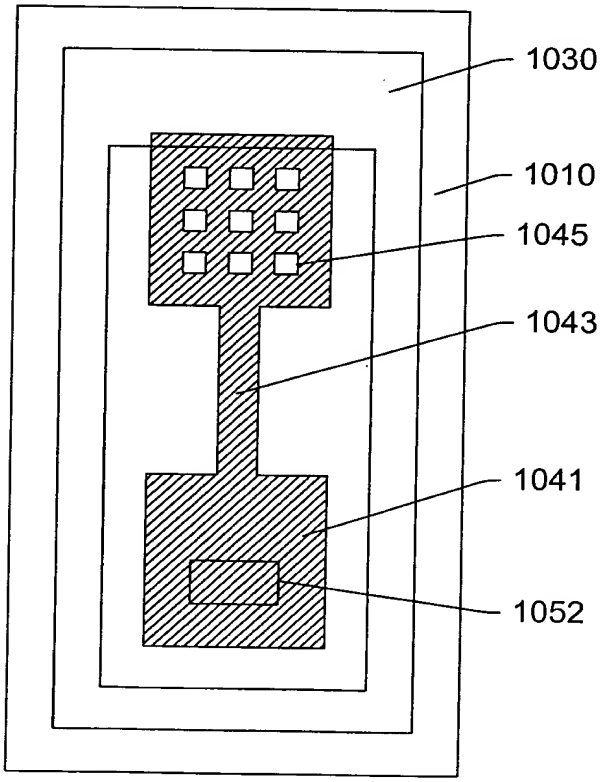


FIG. 74A

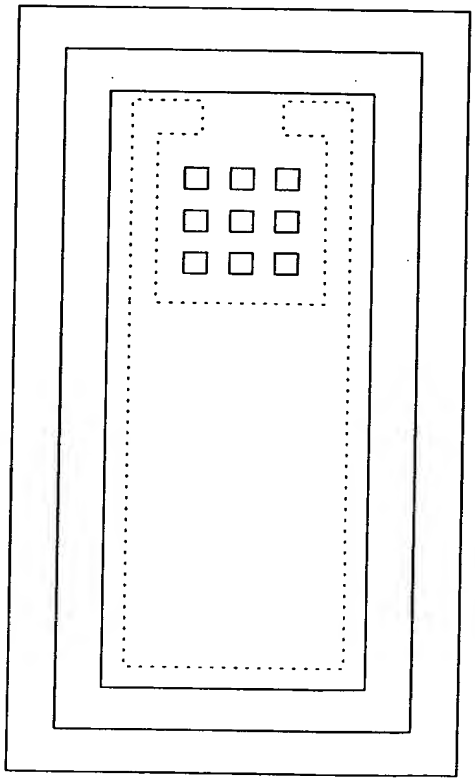


FIG. 74B

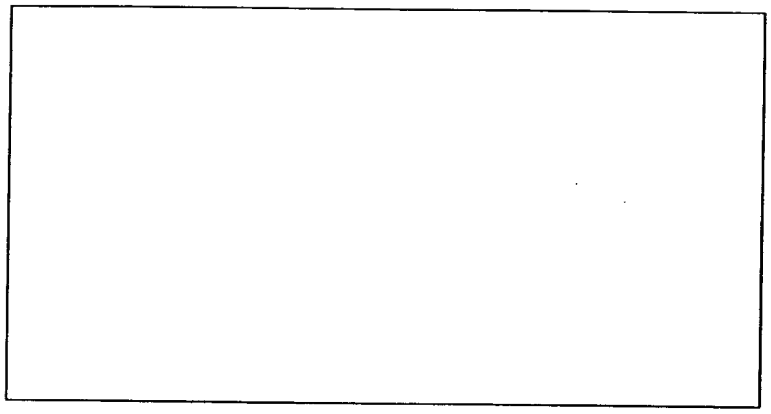


FIG. 75D

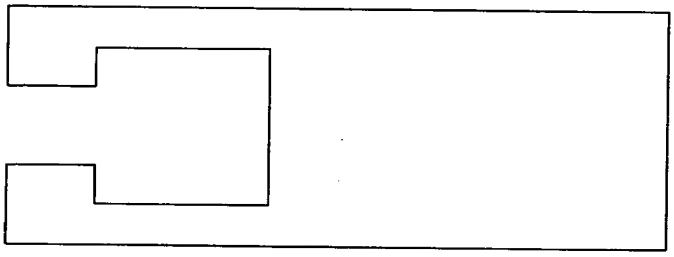


FIG. 75C

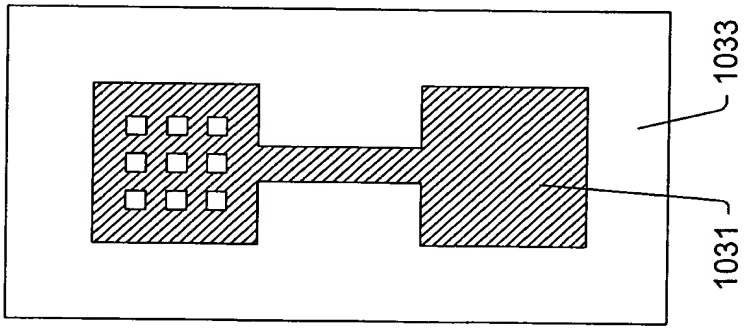


FIG. 75B

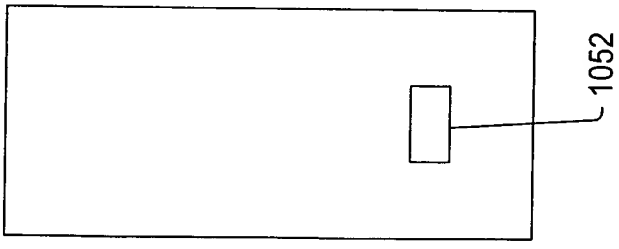


FIG. 75A

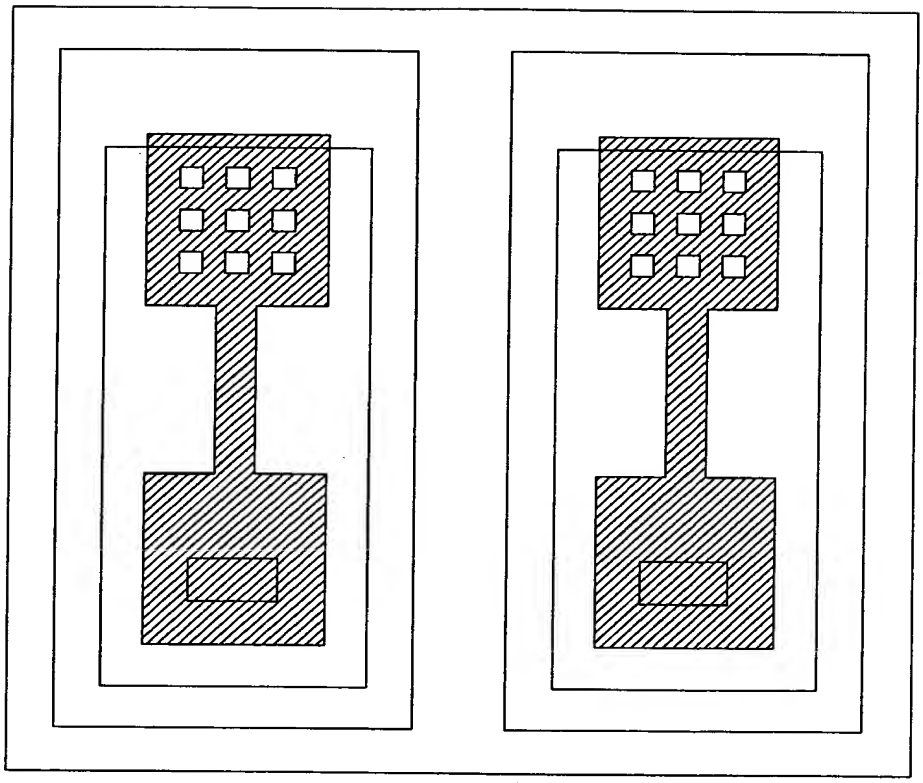


FIG. 76

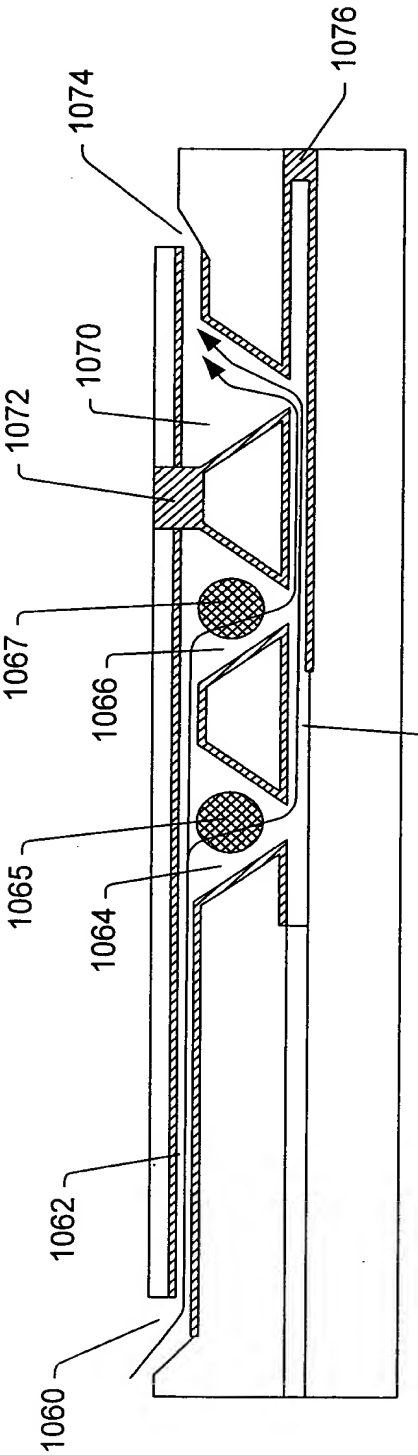


FIG. 77

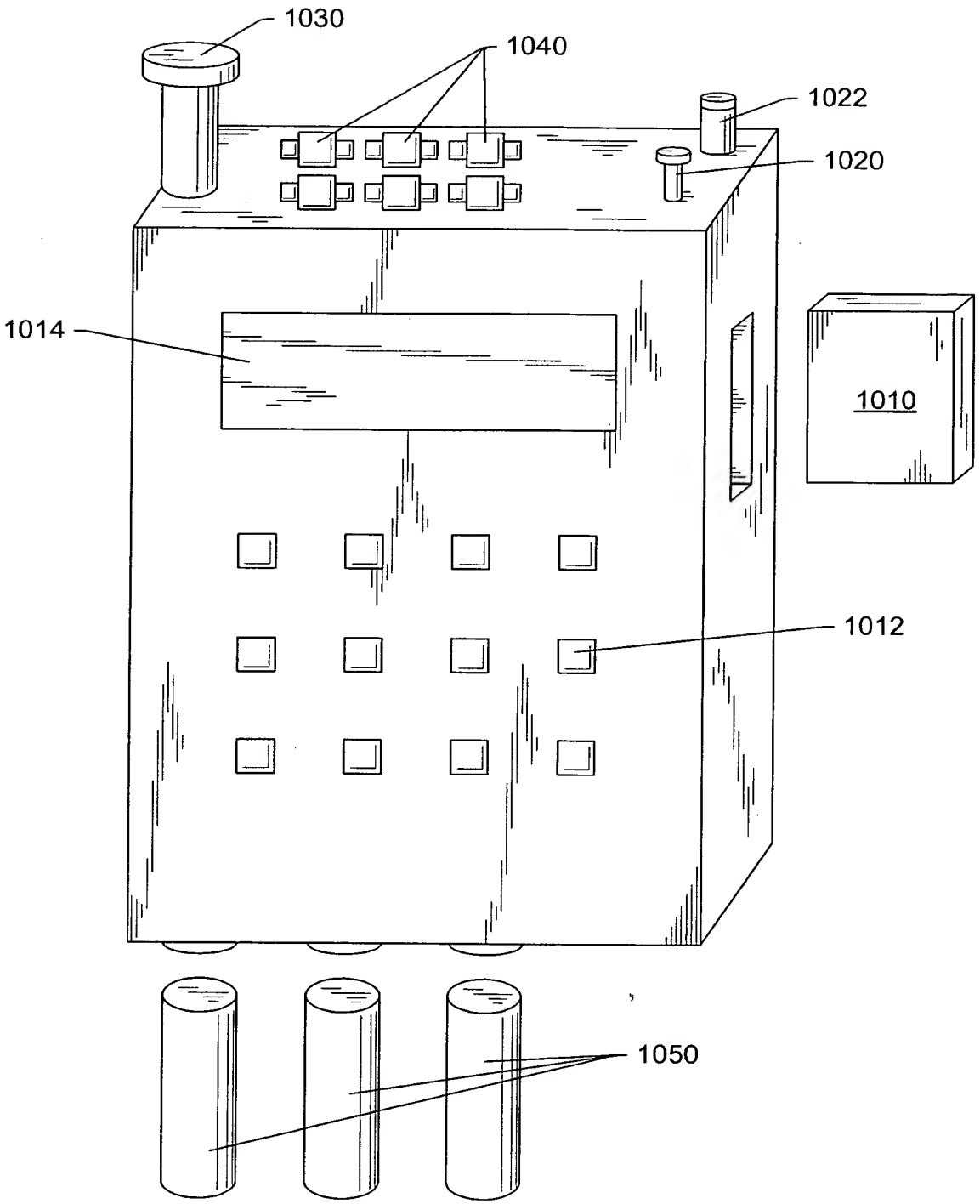


FIG. 78

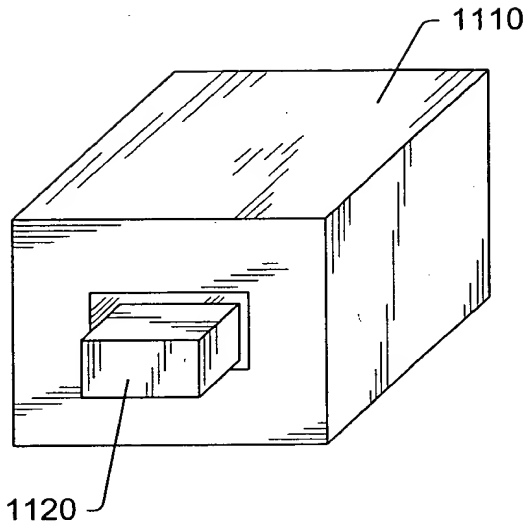


FIG. 79A

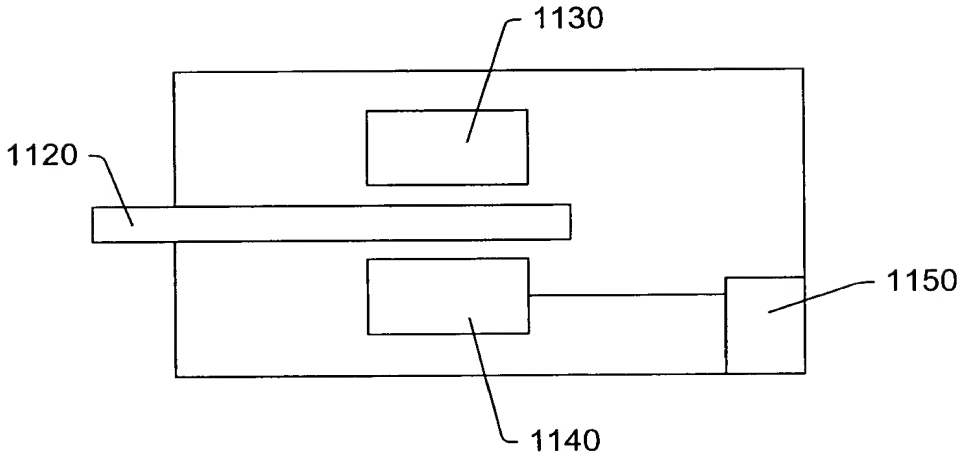
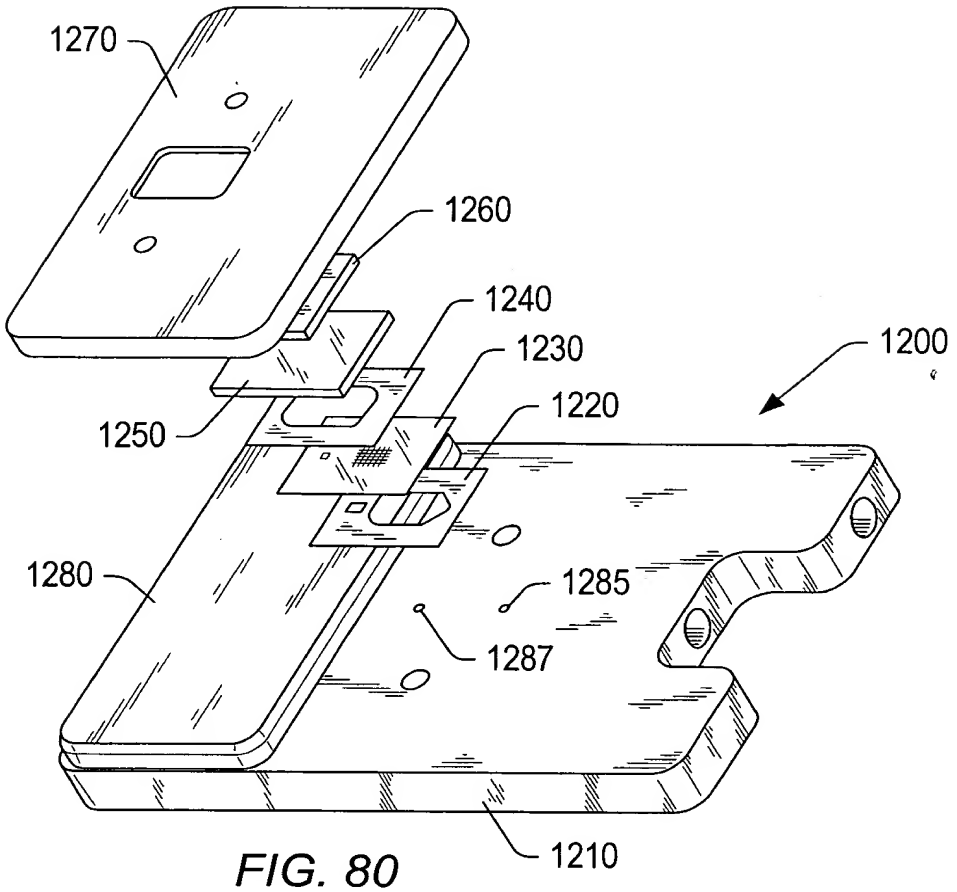


FIG. 79B


1270
1260
1240
1230
1200
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1220
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1287
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FIG. 80

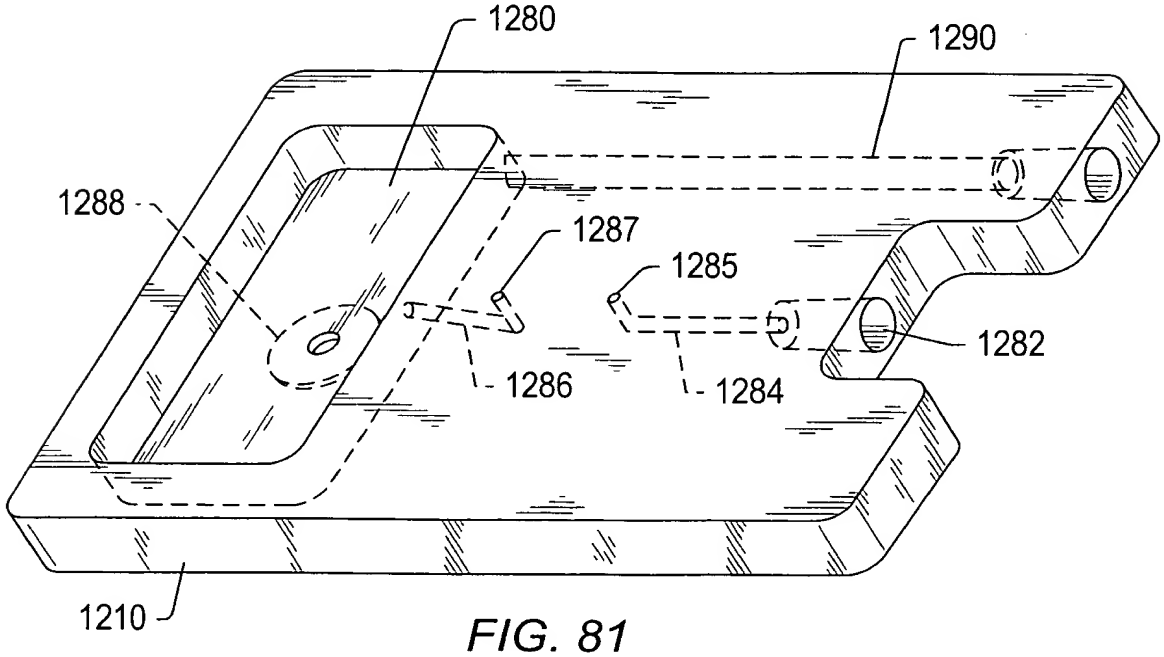
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FIG. 81

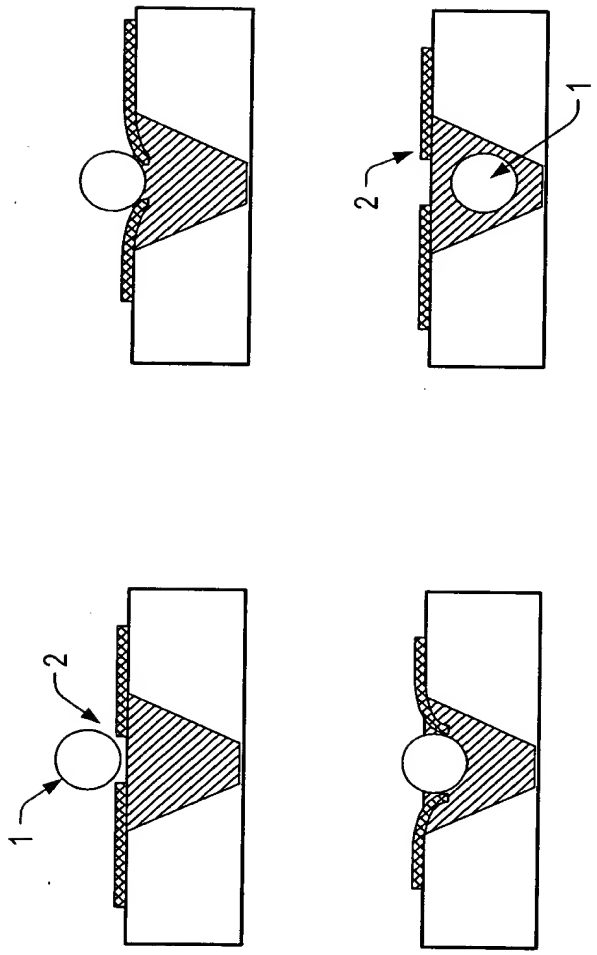

FIG. 82